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Trade and Production Fragmentation

Central European Economies in European Union Networks of Production and Marketing

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The unprecedented globalization of the production process—dividing up the value chain—has brought the integration of trade and the disintegration of production, with deep implications for the international division of labor. Have Central European economies been able to readjust their production structures to international markets? Three of them—Estonia, Hungary, and Slovakia—have done especially well.

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Summary findings

Developments driven by trade liberalization and technological progress mean that old development strategies, based on state intervention and trade protection, no longer work. Global competition has brought a growing emphasis on product standards, rapid innovation, adaptability, and speedy response. Technology has made possible the fragmentation of production.

Firms that become part of global production and distribution networks do not have to be foreign-owned, as many multinationals contract out the delivery of services or products. Foreign involvement facilitates the transfer of managerial and technological know-how, so firms benefit from becoming part of a network. Small producers, rather than servicing small local markets, can supply large firms abroad.

Foreign participation—through outsourcing or direct investment—may offer direct access to a parent company's global networks. Becoming part of a multinational's production and distribution network is a cheap way to market products. But the unprecedented globalization of the production process has brought the integration of trade and the disintegration of production, with deep implications for the international division of labor.

Have Central European economies been able to take advantage of the global fragmentation and disintegration of production and the division of labor?

Ten countries—Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia—have made large strides toward readjusting their production structures to international markets, mainly in the European Union. And trade in industrial products has lost its pre-transition idiosyncratic character. All 10 economies appear to be on the same track as the European Union in changing patterns of trade with the networks Kaminski and Ng discuss.

Progress is advanced in furniture (most of the 10 economies) and automobiles (the Czech Republic, Hungary, Poland, Slovakia, and Slovenia) and is gaining momentum in “information revolution” networks (Estonia and Hungary).

Progress in industrial integration with the European Union has been uneven. The first-tier economies (the Czech Republic, Estonia, Hungary, Poland, Slovakia, and Slovenia) are highly integrated in their trade in manufactures. The lower-tier economies (Bulgaria, Latvia, Lithuania, and Romania) are much less so and, despite relatively low wages, have no comparative advantage in assembly in EU markets.

Among first-tier economies, three stand out: Estonia and Hungary (in integration into “information revolution” markets) and Slovakia (in restructuring its automotive sector).

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Trade and Production Fragmentation: Central European Economies in EU Networks of Production and Marketing

by

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1. INTRODUCTION

Integration into the production and marketing arrangements of the MNCs rather than the pursuit of an autarchic national development strategy offers the most efficient way to take advantage of growth opportunities offered by the global economy. It also seems to be the only option available today. The development strategies of the first-tier East Asian 'tigers' based on heavy state intervention coupled with export promotion and trade protection cannot be repeated in the current global environment. The WTO multilateral disciplines outlaw many practices that first-tier Asian countries (Japan, Korea and Taiwan) followed. Central European countries (CEEC¹), which are the focus of this analysis, are either WTO members or are in the final stages of the accession process.² There are also regional restraints, which are particularly relevant for the CEEC. By signing the European Association Agreements they have already opted for liberalization of their foreign trade and investment regimes vis-à-vis at least the EU and are compelled to pursue this approach.

But the reasons to reject heavy state involvement and protectionism are not purely legal. The world economy has changed dramatically over the last two decades. So has the nature of competition with its growing emphasis on product standards, i.e., customization of markets, rapid innovation, adaptability and speed of responding. Managerial, know-how and technological requirements of successfully competing in international markets have become simply too high to accomplish through reliance on country's own resources. Technology has created new opportunities. It has made possible fragmentation of production process, i.e.; dividing the industry's value chain into smaller functions that can be contracted out to independent suppliers (Borras and Zysman, 1997). This offers unique opportunities to small producers to move from servicing small local markets to supplying large firms abroad.

The net result of these developments driven by technological progress and liberalization in trade and investment is that strategies, which might be effective a couple of decades are no longer viable. In fact, economic success of the so-called third tier of East Asian economies—Malaysia and Thailand—has hinged heavily on opening up to foreign investment. Firms that become part of global production and distribution networks do not have to be foreign-owned, as

¹ This study focuses on Central European countries (CEEC) that signed the Europe Association Agreements and formally applied for EU membership. This group includes the following ten countries: Czech Republic, Estonia, Hungary, Poland, Slovenia, Bulgaria, Romania, Slovakia, Latvia, and Lithuania. The first five have been approved for accession negotiations.

² Estonia and Lithuania are in late stages of negotiations with "... prospects for WTO accession by the end of 1999." (Michalopoulos, 1999, p. 22).

many MNCs contract delivery of services or products. Since foreign involvement brings managerial and technological know-how, it may be critical for a firm to become part of a network.

In addition to managerial and technological expertise, another important advantage is that foreign participation—in form of either ‘outsourcing’ or direct investment—may offer direct access to global networks of a parent company. Becoming part of a production and distribution network of an MNC offers a ‘cheap way’ to market products. Firms do not incur marketing cost, which are usually quite significant for new comers (Roberts and Tybout 1998).

The possibility of ‘dividing up the value chain’ of production allows the development of internationalization of the production process on unprecedented scale with deep implications for the global division of labor. The result of these developments is—to borrow an apt phrase from Feenstra (1998)—integration of trade and disintegration of production in the global economy. Internationalization has been taking place within vertically integrated manufacturing industries with for instance electronic semi-conductors, tuners, valves, etc. assembled in low-wage countries for re-exports. Main industries involved in this process include automobiles, television and radio receivers, sewing machines, office equipment, electrical machinery, power and machine tools, typewriters, cameras and watches (USITC 1996). Trade in industrial parts is the most rapidly growing component of global trade growing faster over the last decade than trade in finished manufactures. According to a very conservative estimate, global trade in parts and components amounting to around US \$800 billion annually accounts for around 30% of world trade in manufactures (Yeats 1998).

The collapse of central planning removed systemic barriers to integration of local firms into international markets. Until then, CEECs remained outside the reach of the globalization process based on production fragmentation or sharing. One would expect that with the transition to competitive markets locally and opening to the world, CEECs stand a good chance of taking advantage of a ‘global disintegration’ of production. But have they become part of this emerging global division of labor driven by fragmentation of production? This question, which, to our knowledge, has not been yet explored, has inspired this research.

More specifically we seek to answer the following questions: How important trade in manufacturing parts has become to CEEC? How diversified are CEEC in terms of production sharing? Have assembly operations migrated to relatively low wage CEEC? Do they compete with each other or are their production structures in terms of parts and components complementary? How diverse have assembly operations become? What is the potential for growth in trade in parts and components? While some studies have recognized the importance of

integration into EU-based networks of production and marketing,³ there has been no attempt to our knowledge to assess comparatively the scope of EU-CEEC trade based on intra-product division of labor.

Although outward processing in textiles and footwear, which accounted for a very large of CEEC-10 exports during the initial stages of transition, meets the criteria of trade induced by production fragmentation, we shall not include it in our analysis. Outward processing often involves only the use of unskilled labor and as such this trade has been volatile and highly sensitive to change in labor costs. While outward processing has triggered foreign investment, but this appears not to have been a frequent occurrence.⁴

The paper is organized as follows. Section 2 discusses methodological issues related to estimating the impact of fragmentation on trade. Section 3 discusses developments in trade in parts and examines similarities and differences among CEECs. Section 4 discusses changes in comparative advantage of CEECs in production of parts and assembling operations. Section 5 examines developments in three major 'global networks': automotive products, office machinery, telecommunications, and furniture. Section 6 concludes.

2. EMPIRICAL ISSUES INVOLVED IN ANALYSIS OF TRADE DRIVEN BY INTRA-PRODUCT SPECIALIZATION

Technologies allowing production fragmentation lead to a spatial distribution of production activity as formerly integrated production process is split into smaller components. The new dimension of this phenomenon is that production fragmentation occurs across national borders thus triggering extra foreign trade flows. A significant portion of this trade is intra-firm trade, i.e., taking place among subsidiaries of MNCs, but not all of it. Outsourcing, which does not involve acquiring property rights over a supplier by a contracting firm is clearly another manifestation of the fragmentation of production.

Despite the apparent growing significance of this trade, there have been few attempts to assess empirically the scope of foreign trade that can be directly attributed to production fragmentation. Some use intra-industry trade (IIT)—as measured by the well-known Grubel-

³ See especially the results of path-breaking research in this area presented in a volume *Enlarging Europe: The Industrial Foundations of a New Political Reality* edited by John Zysman and Andrew Schwartz (University of California at Berkeley, 1998).

⁴ For a detailed analysis of the role and impact of outward processing in 'East-West' trade, see Graziani (1996 and 1998).

Lloyd index⁵— to estimate the growth of trade due to fragmentation (Kierzkowski 1998). While the IIT clearly includes fragmentation-related trade, it also captures a large portion of trade that may have little to do with production sharing or fragmentation. Consider the following: IIT tends to be high among countries with higher similarity in terms of their endowments (incomes) and smaller thresholds of the minimum efficient scale of production (more firms and greater variety supported by the market).⁶ Consumer preferences rather than globalization of production shape trade in, for instance, motor vehicles between the EU and the United States. This trade allows realization of economies of scale thanks to greater product specialization in differentiated products.

Undoubtedly, fragmentation-driven trade accounts for some portion of ITT. The empirically observed positive correlation between multinational activity and IIT would clearly point in this direction. But it would be difficult to estimate the share of this trade in IIT. The distinction between horizontal and vertical intra-industry trade—the latter involves exchange of similar goods of different quality, whereas the former comprises exchange of similar goods that are not differentiated in terms of quality—does little to solve the problem. Products subject to mutual exchanges often enter different market niches, although in some cases lower quality products may be imported for processing.⁷

It seems that the index of horizontal trade specialization (HTS), which is a slightly modified version of the Grubel -Lloyd index, applied to selected product groups offers a better measure of trade due to production sharing and fragmentation. We shall use this index to assess the existence of links within narrowly defined production networks (see Section 5).

Other authors suggest the use of the 'end-use' categories of the US Bureau of Economic Analysis, which allow identification of products by their use by buyers rather than in terms of their positions in production process (Feenstra 1998, Irwin, 1996). They identify the following five categories: foods, feeds and beverages; industrial supplies and materials; capital goods

⁵ The GL index of intra-industry trade between two partners is usually expressed as: $GL = 1 - \frac{|X_i - M_i|}{\sum (X_i + M_i)}$, where X and M are exports of a country and imports by a partner correspondingly of product *i*. The index suffers from two problems: aggregation and aggregate trade imbalances—see Greenway and Milner (1987).

⁶ Technological factors may lower the minimum efficient scale of production and thus allow the market support more firms and greater variety (Hufbauer, 1970).

⁷ For instance, Aturupane, Djankov, and Hoekman (1997) find that vertical intra-industry trade accounted for 80-90 percent of total IIT of CEEC with the EU. It would be impossible to estimate what proportion was further processed in the EU.

(excluding autos); consumer goods (except autos); and automotive vehicles and parts.⁸ While this typology makes possible to assess change in exports and imports in terms of increased or decreased processing, it does not give a more direct information on production sharing. The fall in the combined share of foods, feeds and beverages, industrial supplies and materials merely indicates that processed goods play a growing role in country's trade. But it remains unclear which portion of this trade can be directly attributable to the shift in stages of production (or value chains) across borders.

For instance, developments in CEEC-10 trade with the EU in terms of 'end-use' categories seem to suggest the growing importance of processed goods. The combined share of foods, feeds and beverages, industrial supplies and materials in both exports and imports dramatically declined between 1989 and 1997, and that of capital goods and automotive vehicle and parts significantly expanded (see Appendix Table 1). The picture is clear on the export side and less so on the import side; but the overall trend is that of convergence towards the EU composition of trade in terms of end-use categories. CEECs continue exporting relatively more of food, beverages and industrial supplies than the EU does, but the difference between their respective compositions has been on the decline. It fell from 11 percentage points in 1989 to 8 in 1993 and 4 in 1997. But as was pointed out earlier, it is not clear whether these changes can be attributed to production sharing.

There is a more direct way of estimating this trade. Yeats (1998) brought to attention a simple but overlooked fact—data required to estimate trade in parts have been available in foreign trade statistics based on SITC (Standard International Trade Classification) Revision 2 for the last two decades. Many countries shifted to the SITC Rev. 2 system in the late 1970s. The most complete coverage is within machinery and transport equipment group (SITC 7). It distinguishes among around 60 individual three, four, and five digit product groups consisting solely of other manufactured equipment. As far as other sectors are concerned, the SITC does not do a good job in distinguishing between assembled goods and parts. His empirical findings suggest that trade in parts was the fastest growing component in OECD trade over 1976-96; that it accounts now for around 30% of their trade; and that it is dominated by a very small number of product groups (motor vehicle parts, office equipment and telecommunication equipment).

⁸ The industrial supplies and materials include mainly raw materials but also some basic manufactured goods such as steel, newsprint, textile yarns, etc. The capital goods are used for both investment and as intermediate products (all electrical parts and components except finished consumer goods are regarded as capital goods). The consumer goods are finished household products.

This proxy estimate for production sharing is probably very conservative, as Yeats (1998) warns. After all, the analysis focuses exclusively on parts of machinery and equipment falling into the SITC 7 Section. There is also another reason related to difficulties in distinguishing between parts, components and final product. Although, for instance, a piston engine is not identified as 'a part' in the SITC system, it may be clearly a part of an automobile. Similarly, the SITC system identifies parts to TV tubes, electronic microcircuits. But TV tubes, electronic microcircuits, etc. themselves may be also parts assembled in other products. The line is fuzzy but in some cases its identification is relatively straightforward.

For the purpose of this analysis, we shall reserve the term: parts only to product categories identified as such in the SITC Rev. 2 system. In addition to parts depicted in the SITC 7 section we also include furniture parts identified in miscellaneous manufactured articles (Section 8). While the SITC mentions parts for other products in Section 8, these are lumped together with final products. The term component will be used here for products that the SITC does not define as parts and which are likely to be used in assembling of another final product. Examples abound especially in automobile production. But overall the distinction between a component and a final product may encounter lots of problems.

Taking into account the finding that trade in parts concentrate in a small group of sectors (also confirmed by our empirical analysis of CEEC trade), we focus our analysis on four sectors of manufacturing: office equipment; telecommunication equipment; motor vehicles and furniture. The latter has been included to account for very important role that furniture plays in trade of several CEEC. The first two sectors—office equipment and telecommunication equipment—represent production associated with information revolution. The empirical evidence suggests that MNCs dominate these two sectors as well as motor vehicles. Suppliers in these sectors tend to be either subsidiaries of MNCs or operate in outsourcing within MNC networks of manufacturing and distribution. Anecdotal evidence also suggests that furniture producers tend to be integrated into larger retailers. Therefore, we shall refer to them as production and marketing networks.

Table 1 identifies SITC categories for parts, components and final products of these four production networks. Although networks correspond to SITC divisions (two-digit classification), components and parts from other SITC divisions have been occasionally included. For instance, the telecommunication network embraces TV tubes, electronic microcircuits, etc. as well as parts used in their production. The reason is that these may be used as components in the production of TV and radio receivers. Similarly, SITC items in a motor vehicle production network (SITC 78) include engines (7132), electrical equipment used in motor vehicles (7783) as well as parts for special vehicles—works trucks for handling of cargo (74411).

Table 1: Parts and products: selected product networks identifiable in SITC Rev. 2.

PARTS	COMPONENTS	FINAL PRODUCTS
1. Office machines and automatic data processing machines (SITC Division 75)		
75911		Typewriters (7511)
75915		Duplicating machines (75181), other office machines (75188) and check-writing machines (75118)
75919		Photocopying machines (75188)
7599		Calculating/accounting machines (7512)
2. Telecommunications and sound recording and reproducing apparatus and equipment (SITC 76)		
764		Telecommunication and sound recording/reproducing equipment (76)
76491	Electrical line telephonic and telegraphic apparatus (7641)	
76492	Microphones, loud speakers, electric amplifiers (7642)	
76493		TV receivers (761), radiobroadcast receivers (762), transmitters and receivers (7643) telecommunication equipment, n.e.s. (7648)
76499		Sound recorders and reproducers (tape decks), television image (763)
77689	TV tubes, electronic microcircuits, diodes, transistors (7761-64 and 7768)	
3. Motor vehicles (SITC 78)		
7139	Piston engines (7132)	Road vehicles (78), tractors (722), works trucks (74411) and tanks (95101)
784		Tractors (722), automobiles (781), trucks (782), other road vehicles (783)
	Electrical starting and ignition equipment for internal combustion engines (77831)	
	Electrical lightning, signaling, vipers, defrosters (77832)	
	Generating sets with internal combustion engines (71623)	
74419		Works trucks for handling of goods (74411)
4. Furniture (SITC 82)		
82119		Chairs and other seats (82111)
	Mattress support, etc. (82122)	Furniture for medical, surgical or veterinary practice (82121)
82199		Metal furniture (82191), wood furniture (82192)

The SITC Rev. 2 system falls well short of allowing precise estimates of foreign trade activity within a network. Leaving aside standard weaknesses of foreign trade statistics, the problem is that it does not allow distinguish among various uses of a part or component. For instance, piston engines (7132) include a whole array of engines for cars, trucks, tractors, works trucks and armored vehicles. Parts (7139) include not only parts for piston engines (7132) but also parts used in production of engines for boats (7133). In consequence, one may overestimate the trade generated by a given production network.

The analysis of trade developments within networks supplements that of developments in trade in parts. While the latter may be regarded as a first step in identifying country's involvement in intra-product specialization, the former sheds extra light on assembly operations carried out in a country. In order to identify a country's strong and weak sectors we calculate indices of RCA (revealed comparative advantage).

Since Section 5.1.6 details the procedure that we have adopted, we shall only briefly outline it here. Its major steps are as follows: First, we calculate RCA indices in parts in reference not to world exports but we do it in respect to EU exports of manufactures.

Second, we supplement RCA calculations on exports with those on imports. Ng and Yeats (1999) propose using the revealed comparative advantage concept calculated on imports (rather than exports) to identify specialization pattern in terms of upstream operations. The reasoning behind this modification is simple: Except for an imported part used as replacement for a failed component in an assembled good, parts and components are exchanged for further assembly into a product. It follows that countries with above average import shares for components have a comparative advantage in the assembly operation. In other words, the value of RCA index above unity suggests that firms in a country i are better endowed to carry out assembling than those in the EU. It follows from our detailed analysis that values of 'import' RCA indices are a relatively reliable predictor of specialization up the production chain, i.e., the assembly of a final product or component.

Third, since it does not necessarily imply that they do, we identify items with comparative advantage in both exports and imports. Since the likelihood increases when a product has RCA exceeding unity for both producing (as measured on exports) and assembly operation, we use the values of RCA in the manufacture and assembly jointly to identify the phenomenon of production sharing. The intuition behind it is that a double RCA (above unity) means more specialization in exports of part i and relatively larger imports of part i than in the EU. In other words, while various combinations of values of RCA indices for exports and imports may occur indicating different layers of involvement in production sharing activity, a double 'revealed comparative advantage' indicates a stronger likelihood of participation in production fragmentation.

Fourth, we also calculate the values of RCA indices for components and final products in the production and marketing networks. A country may have a comparative advantage in exports of a component while not having comparative advantage in assembling simply because a significant portion of parts used in the assembly operation may be provided by local suppliers. Furthermore, imports used by local suppliers may appear in trade statistics as parts of other products or may be simply not identified as such.

The approach outlined above implies the following steps of analysis. First, we use a narrow definition of parts to assess major developments in comparative perspective and identify variation, if any, in CEEC performance. Second, we examine areas of specialization of CEEC in

production and assembling. Third, we look closer into patterns of CEEC integration into the EU-based networks of production and marketing.

3. CEECs TRADE IN PARTS

Trade in parts has been the most rapidly growing component of international trade. Yeats and Ng (1999) show that parts and components had driven the 'pre-East Asian financial meltdown' expansion in exports. Analyses pointing to a rapidly increasing level of processing in goods traded by CEEC would suggest that parts and components has been the engine of growth of their trade—see among others Aturupane, Djankov and Hoekman (1998), Baldone, Lasagni and Sdogati (1997, Dobrinsky (1995) and Kaminski, Wang and Winters (1996). Has it indeed been the case? How significant has trade in parts become in CEEC trade with the world? Who are the major partners of CEECs? What sectors play a major role in trade in parts?

3.1. Significance of parts in CEEC trade

The collapse of central planning removed 'systemic' barriers to the development of direct horizontal links among domestic and foreign firms. The emphasis is on 'systemic' since they were a constituent component of central planning. Following its demise, one would expect the emergence of these links hinging critically on the pace of implementation of economic reforms and establishment of business friendly environment. The presence and the lack of expansion in this trade raises interesting questions about the impact of progress in economic reforms and liberalization on the integration into global networks of production and marketing.

Table 2: Structure of Exports and Imports of CEEC in 1993 and 1997 (in million of US dollars and percent)

	Exports (US \$ mill.)		(in percent)		Imports (US \$ mill.)		(in percent)	
	1993	1997	1993	1997	1993	1997	1993	1997
Manufactures:	35,773	73,688	72	78	44,793	95,560	79	77
of which Chemicals	4,138	8,280	8	9	6,462	13,635	11	11
Machinery and Transport excluding parts	6,623	18,855	13	20	14,446	28,632	25	23
Parts	2,789	8,823	6	9	5,822	16,520	10	13
Non-fuel primaries	9,139	14,534	19	15	8,464	13,973	15	11
Fuels	3,781	5,099	8%	5	2,518	13,238	4	11
All intermediate goods	28,390	58,589	57	62	34,016	78,341	60	63
All goods	49,377	94,234	100	100	56,713	124,477	100	100

Source: Computations based on partners' data from UN COMTRADE Statistics.

Table 2 reports values of imports and exports of major product categories including intermediate goods and separately parts and components for CEEC. The value of total CEEC exports of manufactures, which rose more than total exports, doubled between 1993 and 1997. The value of imports of manufactures increased even more. Parts played major role in this

growth: the value of CEEC total trade turnover in parts grew almost threefold from US \$8.7 billion in 1993 to US \$25.3 billion in 1997 with both exports and imports rising at a similar pace, albeit the latter from a lower level. Parts recorded the largest increase in major product categories except for fuels in imports: their share in CEEC exports rose by 50% from 6% in 1993 to 9% in 1997 and in imports by 30% from 10 % to 13%.

Since six of 10 CEECs did not exist in 1989, it is impossible to cast these developments against a longer time horizon. As far as countries for which data are available for the pre-transition period are concerned, two groups of countries—Hungary and Poland, on the one hand, and Bulgaria and Romania—have each displayed similar pattern. Hungary's exports of parts increased 54% between 1989 and 1993 and Poland's by 17%.⁹ On the import side, the corresponding increases were 97% and 225% for Hungary and 114% and 231% for Poland. Between 1993 and 1997 these exports increased 176% and 206% respectively. Bulgaria experienced a large contraction over 1989-93 in both exports (-63%) and imports (-47%). Both recovered over 1993-97, but were still in 1997 more than 30 percent below their respective values in 1989. Romanian exports collapsed (-39%) over 1989-93 and subsequently increased 220%. Imports increased in both periods—272% and 116%.

3.2. Growth of trade in parts

Trade in parts has been the fastest growing component in trade of CEEC as a region. But there were exceptions. Although Bulgaria's exports and imports of intermediate goods grew faster than manufactures, the share of parts in intermediates declined between 1993 and 1997 (Table 3). On the import side, in addition to Bulgaria, Latvia's and Lithuania's imports of intermediates grew faster than imports of parts over 1993-97 and it was roughly the same for both Romania and Slovenia. Import growth rates of parts were higher than exports only for Hungary and Poland, and were the same for Slovenia. The meaning of it is not clear, as our comparator countries (Turkey, Malaysia and Mexico) recorded growth rates of exports higher than those of imports did. However, all CEEC as well as comparator countries run deficits in trade in parts.

The share of parts in total trade of CEEC varies quite significantly on a country-by-country basis (see Appendix Table 2). The share in exports of manufactures ranges between 14% (Czech Republic), 12 % (Slovenia and Hungary) and 1% (Latvia). The share in CEEC imports tends to be significantly higher—it is 21% for Hungary, 15% for the Czech Republic, and 13% for Poland. Although except for Hungary, these shares are considerably lower than those for

⁹ Calculated from data presented in Appendix Table 2.

imports of Malaysia and Mexico, it seems that these three Central Europeans are more involved in production sharing than others. Bulgaria has the lowest share of parts in total imports (6%).

Table 3: Developments in Trade of Intermediate, Parts & Components and Manufacturing Products in Central European Countries

Country	Exports to the World (\$ Mill)			Imports from the World (\$ Mill)			Growth Rate 1993-97		Trade Balance (X-M in \$ Mill)		
	1989	1993	1997	1989	1993	1997	Exports	Imports	1989	1993	1997
BULGARIA											
Intermediate Goods	1,137	1,394	2,519	2,307	1,249	1,954	14.8	11.2	-1,170	145	565
Parts	139	51	92	344	181	235	14.6	6.5	-206	-130	-143
All Manufacturing	2,091	1,398	2,732	3,528	1,750	2,328	16.8	7.1	-1,437	-352	405
CZECH REPUBLIC ^{a/}											
Intermediate Goods	4,027	6,028	13,576	3,683	6,618	15,589	20.3	21.4	344	-590	-2,013
Parts	523	616	2,739	510	1,393	3,512	37.3	23.1	13	-777	-773
All Manufacturing	7,426	7,734	16,800	6,393	8,673	19,040	19.4	19.7	1,033	-940	-2,240
ESTONIA											
Intermediate Goods	N.A.	227	1,432	N.A.	211	2,013	46.1	56.4	N.A.	16	-581
Parts	N.A.	8	283	N.A.	36	362	88.6	57.7	N.A.	-28	-79
All Manufacturing	N.A.	184	1,520	N.A.	271	2,598	52.7	56.5	N.A.	-86	-1,077
HUNGARY											
Intermediate Goods	3,520	4,636	10,562	3,987	6,148	12,633	20.6	18.0	-467	-1,512	-2,071
Parts	486	749	2,066	591	1,162	3,783	25.4	29.5	-104	-414	-1,717
All Manufacturing	5,309	5,493	13,785	6,613	8,560	14,957	23.0	14.0	-1,304	-3,067	-1,173
LATVIA											
Intermediate Goods	N.A.	403	1,387	N.A.	241	1,879	30.9	51.4	N.A.	162	-492
Parts	N.A.	5	42	N.A.	44	220	53.0	40.1	N.A.	-39	-178
All Manufacturing	N.A.	258	1,119	N.A.	440	2,319	36.6	41.6	N.A.	-181	-1,200
LITHUANIA											
Intermediate Goods	N.A.	384	1,291	N.A.	357	2,564	30.3	49.3	N.A.	28	-1,273
Parts	N.A.	3	44	N.A.	50	350	63.9	48.4	N.A.	-47	-306
All Manufacturing	N.A.	347	1,582	N.A.	518	3,212	37.9	45.6	N.A.	-172	-1,630
POLAND											
Intermediate Goods	4,244	7,003	13,112	4,804	10,092	24,803	15.7	22.5	-560	-3,089	-11,691
Parts	431	505	1,546	706	1,510	5,008	27.9	30.0	-275	-1,004	-3,462
All Manufacturing	6,502	8,703	16,405	8,534	13,272	30,592	15.8	20.9	-2,032	-4,569	-14,187
ROMANIA											
Intermediate Goods	3,011	2,151	3,882	1,329	2,428	5,224	14.8	19.2	1,682	-276	-1,342
Parts	150	92	293	89	332	718	29.1	19.3	61	-240	-425
All Manufacturing	4,806	3,542	6,327	2,115	3,103	6,595	14.5	18.8	2,691	439	-268
SLOVAKIA											
Intermediate Goods	N.A.	3,017	5,751	N.A.	3,192	6,496	16.1	17.8	N.A.	-175	-745
Parts	N.A.	298	835	N.A.	508	1,440	25.8	26.1	N.A.	-210	-605
All Manufacturing	N.A.	3,517	6,963	N.A.	3,873	7,542	17.1	16.7	N.A.	-356	-579
SLOVENIA											
Intermediate Goods	N.A.	3,147	5,078	N.A.	3,481	5,187	12.0	10.0	N.A.	-334	-109
Parts	N.A.	461	883	N.A.	606	892	16.2	9.7	N.A.	-145	-9
All Manufacturing	N.A.	4,597	6,457	N.A.	4,333	6,378	8.5	9.7	N.A.	264	79
Memo Items:											
TURKEY											
Intermediate Goods	4,369	5,643	9,231	8,178	15,516	25,532	12.3	12.5	-3,809	-9,873	-16,301
Parts	213	380	862	1,508	3,413	4,391	20.5	6.3	-1,294	-3,034	-3,529
All Manufacturing	8,137	9,908	15,646	8,600	19,041	29,987	11.4	11.4	-463	-9,134	-14,340
MALAYSIA											
Intermediate Goods	18,310	32,655	53,915	14,516	30,000	54,659	12.5	15.0	3,794	2,655	-744
Parts	1,709	6,090	13,507	3,233	7,941	14,477	19.9	15.0	-1,524	-1,851	-970
All Manufacturing	13,634	37,504	68,424	15,722	33,122	61,480	15.0	15.5	-2,088	4,382	6,944
MEXICO											
Intermediate Goods	18,423	25,974	52,181	23,923	42,344	66,350	17.4	11.2	-5,501	-16,370	-14,169
Parts	4,654	8,196	15,641	8,433	14,832	20,667	16.2	8.3	-3,779	-6,636	-5,026
All Manufacturing	21,609	35,847	82,567	25,503	47,078	72,714	20.9	10.9	-3,894	-11,232	9,854

Note: a/ The 1989 data of Czech Republic are data for former Czechoslovakia

Source: Computations based on partners' data from UN COMTRADE Statistics.

How does the performance of CEEC as a region and individual countries compare with that of our group of comparators? The increase in CEEC exports over 1993-97 of 185% was larger than corresponding increases in the value of Mexican exports (91%) and Turkish exports (127%), but lower than the increase in Malaysian exports (227%). Note that Hungary and Poland recorded larger increases than Malaysia. On the import side, Turkey (129%) recorded the largest increase—CEEC imports grew 98%.

3.3. Composition of trade in parts

Table 4 reports values of CEEC-10 imports and exports of parts sorted in descending order according to the value of imports in 1998. Table 4 does not include all parts but only those with the value of either exports or imports above US \$50 million. Parts not included accounted for 5 percent and 3 percent of exports and 4 and 2 percent of imports of all parts in 1993 and 1998 respectively.

Trade in parts is highly concentrated in few items in both exports and imports. Top four product groups accounted for 69 (71% in 1997) percent of imports of all parts and 45 percent (53% in 1997) of exports in 1998. Moreover, there is a high degree of correspondence between imports and exports—their rankings only marginally diverge. In other words, large exports require large imports, which appears to suggest that within product groups production sharing takes place. Trade in motor vehicle parts (SITC 784) is the largest item in both exports and imports. Their turnover increased from US \$1.7 billion to US \$7.3 billion over this period. Telecommunication parts, the second largest item in CEEC imports of parts, rank third in CEEC exports after parts of switchgear.

One should note that the ranking of parts in terms of values of exports and imports is very similar to that for OECD countries (excluding Mexico and new members from Central Europe). Parts to motor vehicles (784), office and computing machines (759), and telecommunication equipment (764) account for two-thirds of trade turnover of these countries in parts (Yeats 1998). Hence, it appears overall that CEEC have become incorporated into this vastly expanding trade.

CEEC import more parts than they export, although the gap has been on the decline. While in 1993 export earnings accounted for 48 percent of import expenditure on parts, this ratio of exports to imports slightly increased to 53 percent in 1997 and surge to 60 percent in 1998. But trade deficit in parts is hardly surprising. Consider that highly developed countries run trade surplus in parts, especially high in such large items as parts of motor vehicles and parts of telecommunication equipment (Yeats 1998). If anything, this demonstrates that fragmentation of

Table 4: CEEC-10 Export and Import Values and Shares of Parts, 1993 and 1997 (in million of US dollars and percent)

Parts	CEEC10 Exports to the World				CEEC10 Imports from the World			
	1993 Value	1993 Share (%)	1998 Value	1998 Share (%)	1993 Value	1993 Share (%)	1998 Value	1998 Share (%)
784 Motor vehicle parts and accessories	571	20.5	2,876	24.2	1,093	18.8	4,914	24.9
764 telecom equipment parts and accessories	291	10.4	1,176	9.9	1,256	21.6	4,077	20.7
772 switchgear parts	331	11.9	1,479	12.5	703	12.1	2,611	13.3
759 office machinery—parts, accessories	66	2.4	809	6.8	619	10.6	2,004	10.2
7139 piston engine parts	95	3.4	417	3.5	142	2.4	992	5.0
72849 parts of machines of other industries	37	1.3	207	1.7	170	2.9	447	2.3
7449 parts of machinery of loading	195	7.0	534	4.5	149	2.6	354	1.8
7169 parts of rotary electric plants	115	4.1	971	8.2	54	0.9	348	1.8
74999 machine parts, non-electric	13	0.5	373	3.1	150	2.6	306	1.6
82119 parts of chairs, etc.	143	5.1	52	0.4	46	0.8	292	1.5
7439 parts of app of filters	41	1.5	361	3.0	106	1.8	286	1.5
7369 parts of tools of metal	50	1.8	155	1.3	63	1.1	212	1.1
82199 other furniture parts	117	4.2	354	3.0	76	1.3	191	1.0
79199 parts of electric locomotives	94	3.4	64	0.5	68	1.2	150	0.8
7429 parts of pumps of liquids	32	1.1	252	2.1	47	0.8	149	0.8
77129 parts of machinery of electric power	33	1.2	148	1.3	36	0.6	147	0.7
78539 parts, accessories of cycles	25	0.9	181	1.5	67	1.1	145	0.7
74149 parts of refrigerator equipment	13	0.5	101	0.9	45	0.8	132	0.7
7259 parts of machines of paper milling	10	0.3	74	0.6	93	1.6	119	0.6
78689 parts of trailers etc	76	2.7	43	0.4	45	0.8	116	0.6
74523 packing etc machinery parts	13	0.5	68	0.6	59	1.0	114	0.6
7149 engine & motor parts	26	0.9	60	0.5	30	0.5	105	0.5
7119 parts of steam boilers and auxiliary plants	39	1.4	23	0.2	27	0.5	101	0.5
72839 parts of mineral working machinery	24	0.9	102	0.9	39	0.7	95	0.5
72449 parts of spinning machines	15	0.6	57	0.5	40	0.7	94	0.5
77689 electronic component parts	8	0.3	80	0.7	21	0.4	91	0.5
72479 textile machinery parts	17	0.6	73	0.6	31	0.5	85	0.4
77589 electric machinery parts	30	1.1	31	0.3	23	0.4	75	0.4
72129 parts of machinery of harvesting	39	1.4	31	0.3	21	0.4	66	0.3
77889 electric parts of machinery	6	0.2	31	0.3	56	1.0	64	0.3
71332 other than outboard for marine	23	0.8	58	0.5	43	0.7	63	0.3
7269 parts of printing and typesetting machinery	8	0.3	118	1.0	37	0.6	61	0.3
72469 loom, knit machinery parts	15	0.5	97	0.8	28	0.5	59	0.3
77819 electric accumulator parts	4	0.1	45	0.4	25	0.4	57	0.3
7929 aircraft parts	19	0.7	17	0.1	48	0.8	53	0.3
73729 roll-mill parts, rolls	21	0.8	54	0.5	28	0.5	51	0.3
ALL PARTS	2,789	100	11,876	100	5,822	100	19,702	100.0
Memo Items:			304	0.4			476	0.5
ALL CEEC10 PARTS	2,789	8.8	11,876	14.2	5,823	15.2	19,702	20.2
ALL CEEC10 MANUFACTURING EXCL CHEMICALS	31,635	100.0	83,415	100	38,330	100	97,663	100.0

Source: Computations based on partners' data from UN COMTRADE Statistics.

production involves moving production facilities to less developed countries with parts supplied from highly developed countries. In this sense, one may suspect the existence of a positive link between the level of development and trade surplus in parts.

Another reason exacerbating trade deficits in parts may be related to assembly operations that were established to jump high tariffs introduced specifically to lure foreign investors. Many CEEC have very low applied tariff rates on parts and high tariff rates as well as nontariff barriers on finished manufactures. The high levels of effective rates of protection often provide strong incentive to exporters to establish assembly operations. For instance, this consideration has been behind the proliferation of assembly operations of automobiles in Poland in the 1990s.

The possible distortionary impact of ill-designed policies notwithstanding the crux of the matter is that parts account for a growing share of manufactures in world trade. CEEC seem to have become part of this global trend, which indicates that they are not missing the boat of emerging global division of labor based on production fragmentation. The share of parts in their trade has been on the increase, although not in all major SITC double-digit groups. Furthermore, data for Malaysia, Mexico as well as for some CEEC suggest that at some point exports tend to grow faster than imports.

Table 5: Imports of parts and the share of imported parts in a product group, 1993, 1997 and 1998

Commodity Group SITC Rev. 2	Value of Parts (million of US dollars)			Share of Parts in a Product Group (in %)		
	1993	1997	1998	1993	1997	1998
71 Power Generating Equipment	307	1,136	1,520	39.0	40.9	40.7
72 Machines for Special Industries	573	1,011	1,206	18.5	18.2	19.7
73 Metal Working Machinery	127	255	227	19.3	21.3	17.3
74 Machines for General Industries	562	1,083	1,303	16.1	16.2	15.7
75 Office Machines & Equipment	619	1,169	2,004	37.9	44.6	47.8
76 Telecommunication Equipment	1,256	3,569	4,077	78.6	84.6	83.9
77 Electrical Machinery	892	2,386	3,182	28.6	29.3	30.3
78 Road Vehicles	1,205	5,253	5,177	23.4	41.4	39.2
79 Other Transport Equipment	116	213	372	17.1	19.6	30.8
8 Other Manufacturing etc.	166	446	633	2.2	3.3	3.9
All Above Parts & Components	5,823	16,520	19,702	20.9	28.2	28.4

Source: Computations based on CEEC data as provided to the UN COMTRADE database.

Another symptom of the likely involvement in a finer and deeper international division of labor is the increase of the share of parts in imports of a given product category. While one may not discount the possibility that some of these operations involve assembly due to high effective rates of protection of final products, high import content also indicates upgrading of final products. Three observations can be derived from Table 5, which provides information on the part content in imports in major two-digit SITC product groups. First and foremost, a very considerable overall increase in the share of parts in total imports of products (made of them) by

about one-third from 21 percent in 1993 to 28 percent in 1998 points to the growing involvement of CEEC-10 in division of labor based on fragmentation of production. Note that the 'part content' of imports increased for all identified product categories. The value of these imports increased more than three-fold between 1993 and 1998 and grew 19 percent in 1998. The highest growth in 1998 that occurred in "other transport equipment" (75% increase in 1998) and "office machines and equipment" (72%) suggests CEEC growing involvement in international networks (see Section 5).

Second, automotive industry has been largely responsible for the increase in imports of parts. The share of imported parts in imports of final products and components classified as SITC. 78 grew from 23 percent in 1993 to 41 percent in 1997 and slightly contracted in 1998 to 39 percent.

Last, the "part content" significantly varies by product groups. The largest "part content" is in telecommunication equipment—this share was 84 percent in 1998. This may be related to the ongoing process of modernization of telecommunication networks in several CEEC.

3.4. Geographic patterns: the EU as a hub?

The geographical pattern of CEEC trade in parts has undergone similar change, if not more dramatic, as that in total trade. The collapse of the CMEA effectively terminated whatever production sharing existed under central planning. Excluding trade of newly established states (Baltic states, Slovenia) and treating former Czechoslovakia as a single economy, the share of inter-CEEC exports in parts fell from 35 percent in 1989 to around 3 percent in 1993. This share remained stable between 1993 and 1997, and slightly increased on the import side. Note, however, that the value of both exports and imports of parts roughly tripled over this period.

Yet this trade remains relatively small rarely exceeding the value of US \$20 million. Leaving aside trade in parts within the Czech and Slovak customs union, only trade between Czech firms and those from Hungary and Poland would have passed this threshold. Without Czech and Slovak mutual exchanges in parts, the value of intra-CEEC trade would have been 40 percent lower.

With the value of trade with the EU having increased more than with any other trading partner, the EU has expanded its position as a 'hub' for CEEC trade in parts. The share of parts in EU-oriented CEC exports is significantly higher than the share of manufactures in CEEC EU-oriented exports. The share of the EU in CEC exports of parts increased from 71 percent in 1993 to 79 percent in 1998 and the share in imports from 76 percent to 82 percent over the same period (Table 6). The rapid expansion in exports of parts to the EU (44% in 1998) and the increase in the

ratio of EU-directed exports to imports (from 45 in 1993 to 49% in 1997 and 58% in 1998) points to the growing role of CEEC as suppliers of parts. The increase occurred at the expense of intra-CEEC exchanges (less than a twofold increase) as well as trade with NAFTA and East Asia (less than a twofold increase). However, the share of the latter in CEC imports increased in 1998 probably because of the growing presence of MNCs from Korea and Japan.

Table 6: Direction of trade of CEEC in 1993, 1997 and 1998 (in million of US dollars and percent)

Region/Group	Imports of Parts (\$ Million)			Shares in Total Imports of Parts (%)			Exports of Parts (\$ Million)			Shares in Total Exports of Parts (%)		
	1993	1997	1998	1993	1997	1998	1993	1997	1998	1993	1997	1998
Intra-CEEC	376	1,183	1,212	10.6	7.2	6.2	354	1,071	1,085	12.7	12.1	9.1
EU15:	4,404	13,384	16,107	75.6	81.0	81.8	1,982	6,569	9,431	71.1	74.5	79.4
of which Germany	2,029	7,183	7,753	34.9	43.5	39.4	1,200	4,484	5,903	43.0	50.8	49.7
NAFTA	337	653	756	5.8	4.0	3.8	156	395	491	5.6	4.5	4.1
East Asia (incl. Japan)	302	623	877	5.2	3.8	4.5	52	102	110	1.9	1.2	0.9
Other	403	677	750	2.8	4.1	3.8	245	686	759	8.8	7.8	6.4
Total	5,822	16,520	19,702	100	100	100	2,789	8,823	11,876	100	100	100

Note: For 1993 intra-CEEC imports for Latvia, Lithuania and Slovakia are based on the 1994 data.

Source: Computations based on partners' data from UN COMTRADE Statistics.

Among EU countries Germany has emerged as the most important trading partner in parts. It takes around half of CEEC total exports of parts and accounts for 39 percent of their total imports of parts. It is not clear whether the contraction in the share of Germany in CEEC trade in 1998 indicates the increase in geographical diversification. Austria, a very important trading partner of CEEC before the collapse of central planning, has been losing its position. Its share in CEEC trade in parts fell by almost half between 1993 and 1997. These two countries accounted for 74 and 76 percent of CEEC exports to the EU in 1993 and 1997 and 58 and 62 percent of imports of parts.

CEECs have become significant suppliers as well as markets for parts produced in the EU. EU imported about US \$33 billion of parts in 1993—CEECs with exports of US \$2 billion accounted for 6 percent of EU external imports. EU imports of parts from CEECs increased to US \$60 billion and so did CEEC exports to US \$6.6 billion in 1997—their share in EU imports increased to 11 percent. CEECs accounted for 10.8 percent of EU exports (US \$41 billion) in 1993, and almost 17 percent of EU exports of parts in 1997.

Hence, CEECs' geographical concentration of trade in parts increased. And so it did within the EU with Germany's becoming the major market for parts originating in CEEC—the share of Germany in EU imports of parts grew from 60 to 68 percent between 1993 and 1997. This was mainly at the expense of NAFTA whose share in CEEC imports of parts fell from 6 percent in 1993 to 4 percent in 1997 and in exports from 5.6 percent to 4.5 percent. It is

interesting to note that the share of intra-CEEC trade remained stable: its share in total exports fell from 12.7% to 12.1%, but the share in exports increased from 6.5% to 7.2% over 1993-97.

Country-level data on directions of trade in parts show variation between first wave EU-applicants (Czech Republic, Estonia, Hungary, Poland and Slovenia) and those of the second tier. On the import side, the geographical patterns of CEEC are remarkably similar to each other although the second tier CEECs tend to concentrate less on the EU than the first wave candidates (Table 7).

Table 7: Directions of trade in parts of CEEC-10 in 1998 (in million of US dollars and in percent)

Reporter\Partner	European Union		CEEC10		Russia		NAFTA		East Asia including Japan		World	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Bulgaria	14	96	4	4	9	4	1	10	0	15	45	139
Czech Republic	3,640	3,537	578	308	71	13	68	171	103	314	4,718	4,542
Estonia	257	315	18	5	42	2	9	13	5	40	336	385
Hungary	2,955	4,213	99	96	10	5	136	344	20	776	3,370	5,546
Latvia	56	177	8	31	15	9	1	16	0	8	90	269
Lithuania	43	265	21	42	19	19	2	26	1	12	115	388
Poland	1,505	3,820	167	325	74	20	105	306	22	934	2,077	5,691
Romania	216	604	23	37	2	2	17	149	9	167	355	1,034
Slovakia	719	1,463	243	225	7	5	3	109	3	67	1,032	1,964
Slovenia	942	930	49	14	54	0	21	39	6	47	1,203	1,114
Total CEEC-10	10,346	15,420	1,212	1,085	301	79	363	1,182	169	2,380	13,342	21,072
<i>Memo items:</i>												
Turkey	527	3,303	28	105	26	3	103	492	22	700	1,057	4,851
Malaysia	2,342	2,347	42	3	11	1	4,113	4,933	7,280	9,293	14,371	16,952
Mexico	480	2,208	113	6	1	2	17,577	18,156	641	2,186	19,100	22,848
Reporter\partner	In terms of percent											
Bulgaria	30.5	68.7	9.5	3.0	19.7	2.6	2.4	7.0	0.4	10.6	100.0	100.0
Czech Republic	77.1	77.9	12.3	6.8	1.5	0.3	1.4	3.8	2.2	6.9	100.0	100.0
Estonia	76.7	81.8	5.2	1.2	12.5	0.6	2.5	3.5	1.4	10.3	100.0	100.0
Hungary	87.7	76.0	2.9	1.7	0.3	0.1	4.0	6.2	0.6	14.0	100.0	100.0
Latvia	62.4	65.7	9.3	11.3	16.8	3.2	0.9	6.1	0.2	2.9	100.0	100.0
Lithuania	36.8	68.2	18.4	10.8	16.0	5.0	1.9	6.6	0.7	3.1	100.0	100.0
Poland	72.5	67.1	8.1	5.7	3.6	0.3	5.0	5.4	1.0	16.4	100.0	100.0
Romania	60.8	58.4	6.6	3.6	0.4	0.2	4.8	14.4	2.5	16.2	100.0	100.0
Slovakia	69.7	74.5	23.6	11.5	0.6	0.3	0.3	5.6	0.3	3.4	100.0	100.0
Slovenia	78.3	83.5	4.0	1.2	4.5	0.0	1.7	3.5	0.5	4.2	100.0	100.0
Total CEEC-10	77.5	73.2	9.1	5.1	2.3	0.4	2.7	5.6	1.3	11.3	100.0	100.0
<i>Memo items:</i>												
Turkey	49.9	68.1	2.7	2.2	2.4	0.1	9.8	10.1	2.1	14.4	100.0	100.0
Malaysia	16.3	13.8	0.3	0.0	0.1	0.0	28.6	29.1	50.7	54.8	100.0	100.0
Mexico	2.5	9.7	0.6	0.0	0.0	0.0	92.0	79.5	3.4	9.6	100.0	100.0

Source: Based on direct reporting from UN COMTRADE Statistics.

The variation is limited to exports, which appears to shed some light on the extent of integration into EU production networks. The shares of the EU in exports of first-tier candidates range between 73 percent (Poland) and 88 percent (Hungary). They correspond roughly to EU shares in their imports. On the other hand, the shares of the EU in exports of parts in second-wave

EU candidates are significantly lower. Bulgaria, which exports almost 60 percent of parts to partners outside the CEEC-EU region, is an extreme case. In addition to Bulgaria, Lithuania and Romania have EU-shares below Turkey's level of 51 percent. Russia remains a relatively important partner for Latvia, Lithuania, Bulgaria and to a lesser degree for Estonia. Romania exports 8 percent of its parts to NAFTA and East Asia.

Taking the EU and CEEC as a single region, which overlaps with a Pan-European Cumulation Area (without Switzerland) does not significantly change the picture. On average, the share of extra-regional exports in CEEC exports of parts amounts to 14 percent. Czech Republic (11 percent), Slovakia (6), Hungary (9) and Estonia are below or at the average. Bulgaria (60) followed by Lithuania (45) Romania (19) and Latvia (18) are above the average. On the import side, Czech Republic (11), Estonia (17), Slovakia (13) and Slovenia (15) are below the average share of 22 percent of extra-regional imports in total CEEC imports of parts.

Viewed in a comparative perspective, the geographic concentration of CEEC trade in parts on EU markets does not strike one as excessive. The combined shares of exports and imports from the EU and CEEC (86 and 78) are similar to the shares of NAFTA in Mexican trade in parts. Moreover, the share of the EU in Mexican trade does not diverge significantly from the share of NAFTA in CEEC trade. On the other hand, however, the geographic pattern of Malaysia is much more diversified, which may be due to its location between East Asia's major markets in Japan and NAFTA. So is Turkey's pattern.

NAFTA and East Asia are mainly suppliers (rather than purchasers) of parts not only to CEEC but also to Turkey and Mexico. While NAFTA and East Asia account for 17 percent of all imports of parts by CEEC, they purchase only 4 percent of their exports of parts. But almost 30 percent of Romania's imports are from there. Around one-fifth of Hungarian and Polish imports are from NAFTA and East Asia. On the export side, NAFTA accounts for around 5 percent of Polish and Romanian exports. On the import side, parts from NAFTA account for 14 percent of Romania's import demand—twice as much as for the second country, Bulgaria with the share of 7 percent.

The foregoing discussion focusing on values and regional shares in trade in parts and components does not take into account the size of partner country markets. The size is important in any assessments concerning the extent of concentration of trade within the region above the 'normal' level as determined by the region's (or a country's) share of world trade in parts and components. One way to account for it is to do this is to use trade intensities as a measure of trade patterns. The trade intensity index (I_{ij}) is defined for country i 's exports to country j as the share of i 's exports going to j (X_{ij}/X_{iw}) relative to the share of j 's imports in world imports ($M_{jw}/(M_w -$

M_{ij}), that is $I_{ij} = (X_{ij}/X_{iw}) / (M_{jw}/(M_w - M_{ij}))$. If the index is greater than one, trade is more 'intense' than would be expected. Trade intensities within the region are often significantly greater than one.

Table 8: Intensities of Trade in Parts in 1997

Reporter \ Partner	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	CEEC-10	EU15	ROW
Bulgaria	N.A.	5.94	1.03	2.43	6.18	7.46	4.44	14.50	3.81	1.08	4.48	1.15	0.77
Czech rep.	4.82	N.A.	0.55	1.10	1.71	3.89	9.03	1.53	58.69	0.89	6.82	1.94	0.21
Estonia	0.02	0.04	N.A.	0.10	101.11	34.25	1.05	0.00	N.A.	N.A.	2.33	2.15	0.28
Hungary	2.09	0.91	0.09	N.A.	1.02	0.97	0.68	4.87	3.38	1.01	0.96	2.38	0.20
Latvia	4.33	0.12	35.36	0.22	N.A.	95.53	1.20	0.02	1.17	N.A.	3.54	1.56	0.57
Lithuania	2.85	0.82	45.14	1.25	249.61	N.A.	2.01	0.29	1.47	0.00	5.55	0.71	0.98
Poland	4.60	7.61	0.96	1.67	4.05	11.47	N.A.	1.70	6.08	0.22	2.92	1.97	0.35
Romania	5.11	0.42	N.A.	1.68	N.A.	0.02	13.90	N.A.	1.47	0.37	4.81	1.26	0.69
Slovakia	3.08	51.95	0.08	2.80	1.88	0.97	3.37	1.27	N.A.	1.01	13.27	1.62	0.13
Slovenia	3.02	1.58	0.06	1.22	0.30	0.03	0.54	1.06	3.06	N.A.	1.09	2.13	0.35
Intra-CEEC	3.51	5.78	1.21	1.06	8.01	5.51	3.92	2.24	20.48	0.65	4.37	1.95	0.27

Note: Bold italics denote the highest trade intensity for a reporter (row); bold denote the intensity below unity for a partner (column).

Source: Computations based on country data as reported to the UN COMTRADE database.

Table 8 reports export intensities (reporters in lines) and import intensities (partners in columns) of parts for intra-CEEC trade, their trade with the EU, and the rest of the world. For instance, intensity of Estonian exports to Hungary is 0.10, while that of Estonian imports is 0.09 (which is equal to Hungarian export intensity vis-à-vis Estonia).

CEEC trade in parts seems to concentrate on the broadly conceived EU-CEEC region. For each CEEC export intensities with the rest of the world (ROW) are well below unity. Two countries stand out. Hungary has less 'intense' trade in parts than expected with CEEC, and Lithuania with the EU. On a country-by-country basis, there is some variation. First, old connections due to previous existence within the same state still seem to matter. Baltic economies trade with each other much more than would be expected, whereas with other CEEC export intensities are mostly below one. Latvia' import intensities from other Baltics are significantly higher than its export intensities, which indicate it is an important market for them. The countries that emerged from the velvet divorce, Czech Republic and Slovakia, remain important markets for parts for each other. Their respective export intensities are still very high well above 50.

Second, geography also matters, but not always. For Bulgaria export intensity is the highest with Romania, while for the latter Bulgaria ranks second after Poland (exports within Daewoo subsidiaries may account for it). Both Balkan countries are not important markets for parts from other CEECs. For Poland, bordering Lithuania, Czech Republic and Slovakia are more

important markets than those of other CEEC. So is Poland for them. Slovakia provides a relatively significant market for Hungary, and the converse is true as well.

Third, two countries stand out. Hungary seems to be more dependent on exports of parts to the EU than to CEEC, for each of which the index is below unity. The intensity of its trade with the EU is the highest among CEEC. The reverse is true for Lithuania, whose exports of parts fall below expectations (export intensity equals 0.71).

Fourth, except for Bulgaria, export intensities in trade with other CEEC are often below unity. Leaving aside Baltic states, this is especially the case of Slovenia. Yet, overall Slovenia is more dependent on exports to other CEEC than on imports.

Parts were among the fastest growing ingredients of CEEC foreign trade. This trade did rise to prominence in trade turnover of each CEEC. But again there is a significant difference between the first wave EU-candidates plus Slovakia and the second-tier group comprising Bulgaria, Romania, Latvia and Lithuania. In the latter, parts accounted for less than 10 percent of turnover in manufactures in 1997. For the former group this share is substantially larger accounting for between 14 percent (Slovenia and Poland) and 22 percent (Hungary).

While the variation is much smaller on the import side ranging from 9 percent (Bulgaria and Latvia) to 25 percent (Hungary), it is higher in terms of shares of parts in exports of manufactures ranging between 3 percent (Bulgaria and Lithuania) and 19 percent (Estonia). Poland has the lowest share of parts in its exports, but still this share is almost twice as large as that of Rumania, which has the highest share among the 'lower' group—Bulgaria, Romania, Latvia and Lithuania. The first-tier EU candidates plus Slovakia seem to be much more involved in trade in parts than other CEECs.

3.5. Country patterns in trade in parts with the EU

Although the European Union is CEEC's largest trading partner, its share in CEEC trade in parts is even larger than either that in total trade or manufactures. In the 1990s this trade was growing faster than with other regions and group of countries. The share of parts in manufactured trade with the EU grew from 9 percent in 1993 to 15 percent in 1997 with automotive parts accounting for one-third of this trade.

What are similarities and differences in CEEC patterns of involvement in production sharing in the EU? We begin with the examination of similarities in CEEC trade with the EU. Table 9 reports correlation coefficients of EU-oriented exports (below the diagonal in italics) and imports (above the diagonal). For comparative purposes three countries are also included: Turkey with its trade with the EU, Mexico with the United States, and Malaysia with East Asia. A quick

glance at the correlation matrix leads to the observation that the composition of imports appears to be more similar than the composition of exports. Interestingly correlations between import baskets of Mexico and Turkey, on the one hand, and that of CEEC-10, on the other, are very high of 0.97 and 0.99. Malaysia's imports seem to be different overall from CEEC (0.77), although its correlation with some CEEC is very high—for instance, Estonia (0.99). Among CEEC, the lowest correlation is for the following country-pairs: Slovenia and Romania (0.46), Poland and Romania (0.59), Estonia and Slovenia (0.58). In all, the correlation between Romania's imports and aggregate CEEC-10 imports is the weakest among CEEC.

Table 9: Correlation coefficients of exports and imports from the EU, 1997

Reporter \Partner	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	CEEC	TUR	MYS	MEX
Bulgaria	1	0.86	0.97	0.73	0.93	0.92	0.77	0.94	0.76	0.68	0.84	0.86	0.98	0.72
Czech Republic	<i>0.64</i>	1	0.80	0.87	0.94	0.90	0.91	0.70	0.93	0.89	0.96	0.92	0.80	0.90
Estonia	<i>0.21</i>	<i>0.16</i>	1	0.68	0.90	0.89	0.69	0.98	0.69	0.58	0.78	0.80	0.99	0.63
Hungary	<i>0.59</i>	<i>0.81</i>	<i>0.62</i>	1	0.88	0.85	0.90	0.56	0.89	0.88	0.94	0.93	0.65	0.95
Latvia	<i>0.41</i>	<i>0.37</i>	<i>0.35</i>	<i>0.40</i>	1	0.99	0.93	0.82	0.93	0.87	0.97	0.97	0.88	0.90
Lithuania	<i>0.17</i>	<i>0.09</i>	<i>0.30</i>	<i>0.19</i>	0.81	1	0.93	0.83	0.92	0.86	0.95	0.97	0.88	0.88
Poland	<i>0.70</i>	0.92	<i>0.28</i>	<i>0.83</i>	<i>0.53</i>	<i>0.30</i>	1	0.59	0.99	0.98	0.98	0.98	0.68	0.98
Romania	<i>0.59</i>	<i>0.75</i>	<i>0.04</i>	<i>0.57</i>	<i>0.41</i>	<i>0.28</i>	<i>0.79</i>	1	0.58	0.46	0.67	0.71	0.98	0.52
Slovakia	<i>0.48</i>	<i>0.82</i>	<i>0.21</i>	<i>0.75</i>	<i>0.23</i>	<i>0.16</i>	0.84	0.77	1	0.98	0.98	0.97	0.68	0.97
Slovenia	<i>0.37</i>	0.71	<i>0.03</i>	<i>0.40</i>	<i>0.43</i>	<i>0.16</i>	<i>0.64</i>	<i>0.50</i>	<i>0.43</i>	1	0.95	0.94	0.57	0.98
CEEC-10	<i>0.66</i>	<i>0.97</i>	<i>0.37</i>	<i>0.90</i>	<i>0.47</i>	<i>0.22</i>	0.96	<i>0.76</i>	<i>0.86</i>	<i>0.69</i>	1	0.99	0.76	0.97
Turkey	<i>0.42</i>	<i>0.77</i>	<i>0.15</i>	<i>0.67</i>	<i>0.20</i>	<i>0.07</i>	<i>0.83</i>	<i>0.69</i>	0.89	<i>0.56</i>	<i>0.82</i>	1	0.79	0.96
Malaysia	<i>0.09</i>	<i>0.15</i>	0.86	<i>0.58</i>	<i>0.19</i>	<i>0.15</i>	<i>0.12</i>	<i>0.04</i>	<i>0.10</i>	<i>0.02</i>	<i>0.29</i>	<i>0.04</i>	1	0.62
Mexico	<i>0.41</i>	<i>0.53</i>	<i>0.84</i>	0.87	<i>0.37</i>	<i>0.21</i>	<i>0.61</i>	<i>0.28</i>	<i>0.48</i>	<i>0.24</i>	<i>0.68</i>	<i>0.49</i>	<i>0.79</i>	1
Memo items:														
1993 and 1997 Imports	0.93	0.92	0.82	0.82	0.94	0.87	0.96	0.98	0.75	0.98	0.97	0.94	0.96	0.97
1993 and 1997 Exports	0.85	0.94	0.68	0.69	0.80	0.73	0.89	0.67	0.43	0.84	0.92	0.93	0.59	0.58

Note: Figures above the diagonal are correlation coefficients of imports and below the diagonal are correlation coefficients of exports (italics). Bold italics denote the largest value of correlation coefficient (For instance, Slovakia's composition of exports of parts to the EU displays the largest similarity to that of Turkey (0.89) and Romania's to Slovakia's one.

For Mexico calculated on its trade with the United States, and for Malaysia on its trade with East Asia.

Source: Computations based on partners' data from UN COMTRADE database.

Correlations between export structures reveal some interesting developments. First, since Mexican exports of parts and components to US markets have been almost exclusively shaped by fragmentation of production carried out by US-based MNCs, high level of correlation with Mexican exports may provide indication as to the extent of country's firms involvement in modern production sharing. By this measure, two CEEC stand out—Hungary (0.87) and Estonia (0.84). Estonia, with its high share of electronic parts, also displays high correlation with Malaysia. These two countries also have the largest shares of parts in their manufacture trade with the EU among CEEC.

Second, low levels of correlation for some country-pairs appear to indicate differences in patterns of integration through production sharing. Estonia again stands out—its correlation

coefficients with other CEEC exports are extremely low except for Hungary. Note again that these countries have high correlation with Malaysia and Mexico. Lithuanian and Latvian structures are similar, but significantly different from all other CEECs.

In order to obtain some insights into dynamics, the last two lines of Table 9 report correlation coefficients between composition of imports/exports of parts from the EU in 1993 and 1997. For most countries there was little change in terms of import baskets. The coefficient is above 0.80 for most countries with the same two exceptions—Estonia and Hungary. Weak correlation between export structures suggests the development of new exports. By this measure, the largest change occurred in EU-oriented exports of Slovakia (correlation of 0.43) followed by Romania (0.67) and Estonia (0.68) and Hungary (0.69). But low value of correlation coefficient may be misleading for Romania, as it experienced huge contraction in exports in the early 1990s. Change in Slovakia's export basket may reflect redirection from the Czech markets rather than deep industrial restructuring.

While these countries have at least one thing in common, i.e., the value of exports of parts at worst at least almost tripled (Hungary) or at best increased forty-five times (Estonia), it seems that in some countries different product groups have been responsible for change (Appendix Table 3). Parts for machines for general industries (SITC 72) were the driving force of Bulgarian and Romanian exports of parts. In Slovak exports to the EU, which increased over 1993-97 from US \$73 million to US \$500 million, automotive parts (SITC 78) were largely responsible for the increase. Their share rose from 16 to 46 percent. The share of parts for office machines and equipment (SITC 75) in Estonia's exports rose from 1.4 percent in 1993 to 32 percent in 1997. Expansion in these exports as well as in automotive parts (SITC 78) drastically changed the composition of Hungarian exports and to a lesser extent that of Polish exports of parts. Parts for electrical machinery (SITC 77) appear to have driven exports of parts originating in Latvia and Lithuania—in Latvian exports their share increased from 4 to 14 percent and in Lithuanian exports from 16 to 22 percent.

The share of aggregate EU-oriented exports and imports of parts in EU-oriented manufactured goods exports and imports may be used as a yardstick to assess country's involvement in production sharing. The share in exports or imports alone would not provide a good indication of the scope of production fragmentation, as the latter involves shipment of parts for further processing in both directions. Table 10 provides data on the values of trade in parts as well as their share in trade in manufactures with the EU.

On the basis of turnover in parts one may distinguish between three groups of countries according to the intensity of their integration into EU manufacturing operations as measured by

the size of trade in parts. The first most integrated group consists of Hungary, Estonia and the Czech Republic. The share of parts in manufactures ranges between 19 and 21 percent (Table 10). The second group with shares ranging from 12 to 16 percent comprises Latvia, Poland, Slovakia and Slovenia. These countries are at intermediate level. Bulgaria, Romania and Lithuania form the third least integrated group.

Table 10: Trade in parts with the EU and share in trade of manufactures, 1998

	Exports (in million of US dollars)	Share of parts in exports of manufactures (in percent)	Imports (in million of US dollars)	Share of parts in imports of manufactures (in percent)	Share of turnover in parts in turnover in manufactures (in percent)
Bulgaria	64	3.5	246	11.1	7.6
Czech Republic	2,992	20.4	3,449	20.8	20.6
Estonia	343	27.9	423	17.2	20.8
Hungary	2,551	17.4	3,980	25.8	21.7
Latvia	23	3.7	171	11.3	9.0
Lithuania	32	2.7	237	11.3	8.2
Poland	1,521	10.5	4,296	16.1	14.1
Romania	266	5.0	718	11.6	8.6
Slovakia	715	12.8	1,650	28.7	20.9
Slovenia	923	17.2	938	14.8	15.9
CEEC10 with EU	9,431	14.5	16,107	18.9	17.0

Source: Computations based on EU data as reported to the UN COMTRADE.

Developments in 1998 as compared in 1997 suggest that this trade has been gaining momentum. CEEC exports increased by 31 percent (from US\$7.2 billion to US\$ 9.4 billion) and imports by 36 percent (US\$ 12 billion to US\$ 16 billion). Except for Lithuania (6 percent increase) and Latvia (contraction of 55 percent in terms of value), other CEEC recorded the increase in exports of at least 25 percent in 1998. The share of turnover in parts in turnover of manufactures increased significantly for each CEEC except Latvia and Lithuania. The increase was particularly significant for Bulgaria (from 6% to 8%) and Romania (7% to 9%).

4. COMPARATIVE ADVANTAGE IN PARTS

The concept of 'revealed comparative advantage' to identify a country's strong and weak sectors (products) in terms of export performance has been widely used in empirical economic studies. A country's sector has a comparative advantage if its exports are more important to this country than in exports of the group of reference countries. In order to assess a country's export specialization in selected markets, for instance in the EU, one may use EU exports. In other words, reference countries then include all exporters from the EU.

Since the purpose of this analysis is to identify a country's 'revealed comparative advantage' in production sharing, we modify this approach in three ways. First, since our focus is

on EU markets, an interesting question is whether CEECs have comparative advantage in parts in these markets. Thus, instead of calculating revealed comparative advantage in reference to the share of a product in world exports, we do it in respect to EU exports of manufactures. Following Balassa (1965), the revealed comparative advantage index (RCA_{ij}) for a component j of country i , is specified here as follows: $RCA_{ij} = (x_{ij}/X_i) / (x^{EU}_j/X^{EU})$, where: x_{ij} is country i 's exports of component j to the EU; $X_i = \sum_j x_{ij}$ is country i 's exports to the EU; $X^{EU}_j = \sum_i x_{ij}$ is EU's total 'external' exports of a component j ; $X^{EU} = \sum_i \sum_j x_{ij}$ is EU's total external exports of manufactures (excluding chemicals). Its interpretation is straightforward. If the index for a product j exceeds unity, a country is said to have comparative advantage in the production of good j because this sector is more important for this country than for EU exporters. If the RCA index is below one, the country is at a comparative disadvantage in EU markets for a good j .

Second, we supplement RCA calculations on exports with those on imports. Ng and Yeats (1999) propose using the revealed comparative advantage concept calculated on imports (rather than exports) to identify specialization pattern in terms of upstream operations. The import RCA index is defined similarly as the traditional RCA index but with imports of a country i from the EU replacing exports to the EU. RCA_{ij}^A measures normalized import shares with normalization in respect to imports of the EU. Thus, the RCA of country i in the assembly of product j is $RCA_{ij}^A = (m_{ij}/M_i) / (M^{EU}_j/M^{EU})$.

The reasoning behind this modification is simple: Except for an imported part used as replacement for a failed component in an assembled good, parts and components are exchanged for further assembly into a product. It follows that countries with above average import shares for components have a comparative advantage in the assembly operation. In other words, the value of RCA index above unity suggests that firms in country i are better endowed to carry out assembling than those in the EU.

But it does not necessarily imply that they do. RCA_{ij}^A above unity simply means that country i imports relatively more of a product j than the EU. These imports may be used for producing a final product sold domestically rather than shipped back to feed a global production process. If these imports are further processed, as production fragmentation would impose, and then delivered for further processing in another country, then foreign trade data should capture these transactions. Thus, at a minimum, there should be not only imports but also exports of parts within the same product category. Although without firm-specific data one can be never sure whether the import-export transaction does not involve completely different firms, i.e., firms operating in different production and distribution networks, there is at least likelihood that production sharing occurs.

This leads to the third modification. Since the likelihood increases when a product has RCA exceeding unity for both producing (as measured on exports) and assembly operation, we use the values of RCA in the manufacture and assembly jointly to identify the phenomenon of production sharing. The intuition is as follows: A double RCA (above unity) means more specialization in exports of part i and relatively larger imports of part i than in the EU.

The caveat is that within one group of parts there are usually many different parts produced and used by different producers. They may also represent varying levels of processing, as the existence of vertical intra-industry trade clearly suggests. Hence, different firms may be involved in different stages of processing or they may operate within different networks (Daewoo as opposed to Fiat, for instance). Some may assemble them into a different component used domestically, whereas others may process and ship them back to the EU. Yet, while various combinations of values of RCA indices for exports and imports may occur indicating different layers of involvement in production sharing activity, a double 'revealed comparative advantage' indicates participation in production fragmentation.

4.1. Change in Comparative Advantage: an overview

Because of lower wages and opportunities offered by dismantling of central planning, one would expect some assembly operations migrate to CEEC with the CEEC increasing also their specialization in the manufacture of parts. Indeed, this is what appears to have happened. While not a single country seemed to have the revealed comparative advantage in assembling (i.e., RCA on imports) in 1989, Czech Republic, Hungary, Slovakia and Slovenia already acquired it in 1993 (Table 11). By 1997 Poland and Estonia have also become specialized in assembly operations. Simultaneously, the values of RCA indices for manufacturing of parts increased for most CEEC except Bulgaria. If anything, this may suggest their growing integration into EU-based processes of production and marketing.

Indeed, the comparison of the pattern of RCA values in CEEC trade with that of countries that have based their industrialization strategy on integrating into production and distribution networks of MNCs suggests strong similarity at least for some CEEC. Note that, as expected, Malaysia and Mexico, economies highly integrated into the economies of their respective partners have RCA above unity in both production and assembling (Mexico's RCA in exports appears to have oscillated around unity). Turkey has comparative advantage in the EU markets in assembling but not in exports. On this count, Turkey appears to be less integrated into the EU production sharing than Estonia, Czech Republic, Hungary, Slovakia and Slovenia. Again considering geography and levels of economic development this comes as no surprise.

Table 11: Revealed Comparative Advantage Indices of Parts in CEEC trade with the EU

COUNTRY	RCA of Exports to EU ^{a/}			RCA of Imports from EU ^{a/}		
	1989	1993	1997	1989	1993	1997
Bulgaria	0.33	0.25	0.19	0.84	0.70	0.71
Czech Republic	N.A.	0.64	1.09	N.A.	1.09	1.40
Estonia	N.A.	0.26	1.32	N.A.	0.59	1.02
Hungary	0.59	0.94	0.94	0.94	1.06	1.85
Latvia	N.A.	0.18	0.20	N.A.	0.68	0.81
Lithuania	N.A.	0.06	0.15	N.A.	0.78	0.96
Poland	0.41	0.38	0.57	0.88	0.88	1.21
Romania	0.11	0.10	0.24	0.41	0.62	0.72
Slovakia	N.A.	0.36	0.83	N.A.	1.22	1.66
Slovenia	N.A.	0.69	0.87	N.A.	1.06	0.95
<i>Memo items:</i>						
Malaysia ^{b/}	1.10	1.33	1.20	1.44	1.65	1.45
Mexico ^{b/}	0.91	1.05	0.84	1.50	1.53	1.33
Turkey	0.20	0.26	0.32	1.34	1.38	1.12

Notes: ^{a/} see main body of the text for the explanation of how RCA Indices were calculated.

^{b/} The values of RCA indices for Malaysia and Mexico are based on North America (USA and Canada) and East Asia (including Japan) respectively.

Source: Computations based on partners' data from UN COMTRADE Statistics.

Estonia and Czech Republic are the only CEEC that have RCA above unity in both assembling and manufacturing of parts. But Hungary is close. It has a strong comparative advantage in the assembly, and the value of RCA index for the parts is close to one. As we shall see (Section 6), had piston engines been included in calculation, Hungary would have had a double comparative advantage.

4.2. RCA indices: the scope of specialization in trade with the EU

If a country has a double comparative advantage for a part, one may expect that the production of this part is integrated into the international production process. Appendix Table 4 reports both RCA indices for 60 part categories in CEEC trade with the EU in 1997. The number of part categories with both RCA indices exceeding unity is particularly large in the case of the Czech industry. Czech firms had a 'double' RCA above unity in 30 product groups. In addition, four categories had comparative advantage in exports. Other countries had a significantly smaller number of part categories with a 'double' RCA index above unity. Slovakia had 15 categories of which 13 overlapped with those in the Czech Republic. Slovenia and Hungary had 15, Poland – 10, Romania – 8, Estonia – 5, and Bulgaria, Latvia and Lithuania – 2.

Do CEEC have any common features as shown in values of RCA indices for individual parts? Or, to put it differently, do they compete in the same groups of products. First, note that there are only few groups of products with 'double' RCA above unity shared by more than five

countries.¹⁰ Hence, there does not seem to be much overlap among CEEC. Bulgaria has a 'double' comparative advantage only in parts of steam boilers (7119) shared with other CEEC except Latvia and Slovenia and parts of loading machinery (7449)—the latter shared only with the Czech Republic. The Czech profile is most notable for the absence of comparative advantage in office machinery parts and telecommunication equipment parts. Otherwise it covers all major machine-building and transportation equipment parts. Estonia's 'double' RCA power is perhaps most notable for specialization in telecommunication equipment (764). Hungary's profile displays significant diversity, albeit less than that of the Czech Republic. (It shares double comparative advantage in 10 product groups with the Czech Republic.) Hungary is the only CEEC with the double comparative advantage in office machinery parts (759), while Estonia is the only other CEEC with RCA above unity in exports of office machinery parts (759). Slovakia is the only CEEC with a double comparative advantage in motor vehicle parts and accessories (784). RCA profiles of Latvia and Lithuania are similar.¹¹ Slovenia and the Czech Republic share double comparative advantage in two categories of furniture parts (82119 and 82199).

Second, they all tend to have a large number of product groups with comparative advantage in assembling: Bulgaria – 18 product groups, Czech Republic – 43, Estonia – 17, Hungary – 36, Latvia – 17, Lithuania – 20, Poland – 35, Romania – 29, Slovakia – 30, and Slovenia – 26. But specialization in exports of parts varies considerably across CEEC: Bulgaria – 9 product groups, Czech Republic – 33, Estonia – 12, Hungary – 20, Latvia – 6, Lithuania – 3, Poland – 17, Romania – 12, Slovakia – 18, and Slovenia – 17.

While the number of products with RCA in assembling varies, there is no clear pattern of overlapping specialization across countries. They all share comparative advantage only in assembly operations based on parts of spinning machinery (72449). There are four groups of parts in which nine CEEC have comparative advantage in assembly: tools of special industries (72819) excluding Bulgaria; hand power tool parts (74519) excluding Hungary; parts to non-electric machinery (74999) excluding Estonia; and parts and accessories of telecommunication equipment (764) excluding Slovenia.¹² Eight CEEC have revealed comparative advantage in parts of other

¹⁰ These include parts of steam-generating boilers (all except Slovenia and Lithuania), parts in building electric generators, and rotary electric engines parts, electrical machinery, tools (each 5 countries).

¹¹ They both have two product groups with double RCA above unity (one shared by two—parts of agricultural machinery). They both have RCA in assembling in the same 7 product groups out of 15 for Latvia and 18 for Lithuania.

¹² Modernization of telecommunication services rather than assembly operations may be responsible for sizable imports of parts and components. Detailed analysis of the values of RCA indices over time would provide an answer as to the cause.

industry (72849—excluding Estonia and Latvia), refrigerating equipment (74149—excluding Bulgaria and Estonia), and packing electric machinery (74523—excluding Estonia and Lithuania). There are five product groups in which seven CEEC have RCA indices larger than unity; two in which six CEEC share comparative advantage; nine in which five CEEC simultaneously have comparative advantage.

4.3. Specialization and trade in parts

The share of part groups with a double comparative advantage in total exports and imports of parts provides indication of a country's participation in global networks of production and distribution. The intuition behind is that RCA above unity for a product group means specialization in both exports and imports. As can be seen from Table 12, these products accounted for significant portions of exports and imports of only a few CEEC in 1997. Slovakia had the highest share of parts with a double comparative advantage in both exports (69%) and imports (52%), followed by the Czech Republic (61% and 45%). Hungary had a lower share of parts with a double comparative advantage in exports (51%) than Slovenia (60%), but a larger share in imports—43 percent against Slovenia's 15 percent. Estonia had large shares in both exports (49%) and imports (50%). The shares for remaining countries were significantly lower than 50 percent.

Table 12: The share of products with a double comparative advantage, comparative advantage in exports and imports in CEEC exports and imports of parts in 1997 (million of US dollars and percent)

Country	Value of exports with double RCA>1	The share in exports of parts (in percent)	Value of exports with export RCA >1	The share in exports of parts (in percent)	Value of imports with double RCA>1	The share in imports of parts (in percent)	Value of imports with import RCA >1	The share in imports of parts (in percent)
Bulgaria	9	18	16	32	11	7	99	60
Czech R.	1,247	61	1,279	63	1,322	45	2,709	92
Estonia	111	49	207	91	166	50	175	53
Hungary	816	51	968	60	1,343	43	2,992	95
Latvia	1	3	9	47	2	1	59	40
Lithuania	5	22	10	47	3	1	133	49
Poland	168	14	493	41	125	3	3,644	89
Romania	51	27	83	44	37	7	359	69
Slovakia	344	69	402	80	543	52	977	94
Slovenia	416	60	442	64	110	15	471	64

Source: Computations based on partners' data from UN COMTRADE Statistics.

The share of exports of parts with 'export' RCA indices exceeding unity indicates the extent of specialization in production of a part as well as concentration of exports. By this measure Estonia—with 91 percent of exports of parts to EU markets having RCA indices exceeding unity in 1997—appears to have reached the highest level, followed by Slovakia (80%),

Slovenia (64%), the Czech Republic (63%) and Hungary (60%). In exports of parts from other countries, the share of parts with 'export' RCA indices exceeding unity varied between 32 percent (Bulgaria) and 47 percent (Latvia and Lithuania).

The 'import' RCA indices for parts above one suggest the existence of comparative advantage in assembly operations. As might be expected, the share of imports of parts meeting this criterion is relatively high for all CEEC. This share tends to be lower for four CEEC that do not have comparative advantage in assembling (see Table 12), i.e., Bulgaria (60%), Latvia (40%), Lithuania (49%), Slovenia (64%) and Romania (69%). High shares for such countries as the Czech Republic (92%), Hungary (95%), Poland (89%) and Slovakia (94%) indicate that parts are not brought only for replacement but also for further processing. It is unclear why Estonia is an exception—although its value of 'import' RCA index exceeds unity, the share of imports meeting this criterion is relatively low (53%).

4.4. Concluding comment

While this analysis only provides indirect indications as to the scope of involvement of firms from CEEC in EU-based networks of production and distribution, it nonetheless allows making some general observations about the growing integration of CEEC firms into EU-based processes of production and marketing. First, most CEEC have made significant strides in becoming competitive in EU markets for parts. Although only two countries (Estonia and Hungary) had RCA index exceeding unity in 1997, there was a significant increase in the values of RCA indices over 1989-97 for other CEEC except Bulgaria.

Second, while not a single country had the revealed comparative advantage in assembling (i.e., RCA on imports) in 1989, Czech Republic, Hungary, Slovakia and Slovenia already acquired it in 1993 and by 1997 Poland and Estonia have also become specialized in assembly operations.

Third, the values of RCA indices (both on exports and imports) display for some CEEC similar patterns in their trade with the EU as those of Malaysia and Mexico. These two countries have successfully based their industrialization strategy on integrating into production and distribution networks of MNCs in Asian and North American markets. Significant parallelism between them and some CEEC suggests that the latter pursue successfully similar strategy of economic restructuring.

Fourth, although CEEC (excluding Bulgaria) have moved fast, some seem to have achieved higher levels of integration as measured by the incidence of 'double' RCA and the corresponding shares of these product groups in their exports and imports. By this measure, the

most integrated seem to be producers from the Czech Republic, Estonia, Hungary, Slovakia and Slovenia. Bulgaria, Latvia and Lithuania appear yet to take advantage of opportunities offered by fragmentation of production.

5. INTEGRATION INTO EU PRODUCTION SHARING ARRANGEMENTS

Trade in parts tends to be highly concentrated. This is a universal phenomenon that has been observed in trade of OECD countries as well as in that of East Asian economies (Yeats 1998 and Ng and Yeats 1999). Top 10 categories account for between 69 percent (Bulgaria) and 95 percent (Estonia) on the export side and 80 (Slovenia) and 92 percent (Estonia) on the import side. There are two other interesting features. First, automotive industry drives production sharing for most CEEC followed by telecommunication and furniture. Motor vehicle parts (SITC 784) rank first or second on both export and import lists of the Czech Republic, Hungary, Poland, Slovenia and Slovakia. Turkey's trade in parts and components with the EU shares the same characteristics. While telecommunication equipment appears high on both export and import lists, it is ranked first only in Estonian trade. The composition of Estonia's trade in parts with its focus on telecommunication and office equipment resembles that of Malaysia. While furniture accounts for a substantial portion of trade of each CEEC, it ranks first in exports of parts from Latvia, Lithuania and Slovenia.

Second, even a cursory examination of categories among top imports and those among top exports shows strong similarity. Products appearing in the top ten are roughly the same and appear in the same order in each CEEC. Clearly, imports are indispensable for exports, and each country follows a very similar pattern.

But does it necessarily imply a division of labor based on fragmentation of production? The participation in a single global process of production involves two-directional transborder flows. One way of capturing their importance is by first assessing the extent of these flows within each important part category and then focusing on selected networks of production and distribution. The latter include not only parts but also components and 'final' products, as identified earlier in Table 1.

5.1. Horizontal Trade Specialization

One way of assessing their scope is to use the index of horizontal trade specialization (HTS), which is a slightly modified version of a G-L index earlier applied to determine the scope of intra-industry trade. The index is defined as follows: $HTS_i = 1 - |X_{ij} - M_{ij}| / (X_{ij} + M_{ij})$, where M_{ij} and X_{ij} are imports and exports of goods respectively, i is a product, and j is a reporting

country (i.e., the EU). The index is zero when either the value of exports or imports is zero, and it equals to one when exports are the same as imports.

Table 13: Horizontal Trade Specialization Indices of Major Parts in CEEC Trade with EU, 1993 & 1997

Country	713 piston engine parts		759 office machine parts		764 telecom-munication parts		772 switch-gear parts		784 motor vehicle parts		821 chairs & furniture parts		All parts	
	1993	1997	1993	1997	1993	1997	1993	1997	1993	1997	1993	1997	1993	1997
Bulgaria	0.18	0.70	0.15	0.14	0.28	0.13	0.48	0.42	0.19	0.35	0.41	0.81	0.36	0.47
Czech R.	0.73	0.81	0.36	0.73	0.14	0.22	0.54	0.78	0.69	0.87	0.73	0.62	0.64	0.82
Estonia	0.06	0.02	0.11	0.51	0.74	0.71	0.30	0.25	0.21	0.19	0.67	0.64	0.47	0.82
Hungary	0.16	0.27	0.22	0.73	0.82	0.58	0.60	0.85	0.57	0.52	0.90	0.54	0.75	0.68
Latvia	0.17	0.07	0.01	0.14	0.24	0.11	0.10	0.23	0.08	0.04	0.79	0.55	0.21	0.22
Lithuania	0.00	0.02	0.01	0.16	0.05	0.07	0.11	0.05	0.05	0.02	0.97	0.52	0.07	0.15
Poland	0.75	0.89	0.10	0.18	0.14	0.24	0.56	0.55	0.25	0.28	0.69	0.65	0.49	0.46
Romania	0.29	0.36	0.04	0.09	0.03	0.04	0.39	0.33	0.34	0.88	0.67	0.43	0.27	0.54
Slovakia	0.25	0.39	0.11	0.52	0.12	0.42	0.27	0.36	0.36	0.71	0.59	0.85	0.43	0.65
Slovenia	0.79	0.75	0.51	0.44	0.28	0.14	0.94	0.84	0.45	0.56	0.29	0.28	0.85	0.97
CEEC-10	0.79	0.49	0.25	0.69	0.42	0.33	0.58	0.68	0.44	0.53	0.62	0.54	0.62	0.66
<i>Memo items:</i>														
Turkey	0.56	0.53	0.10	0.05	0.10	0.14	0.06	0.11	0.16	0.39	0.70	0.65	0.21	0.31
Malaysia	0.04	0.29	0.43	0.10	0.76	0.86	0.66	0.72	0.13	0.07	0.41	0.85	0.68	0.87
Mexico	0.17	0.48	0.31	0.83	0.07	0.47	0.26	0.41	0.25	0.14	0.04	0.77	0.18	0.34

Source: Computations based on EU data as reported to the UN COMTRADE database.

The values of HTS presented in Table13 have been calculated for all parts as well as separately for each of the five top components traded with the EU. These include motor vehicle parts (SITC 784), switchgear parts (772), accessories and parts for telecommunication equipment (764), office equipment parts (759) and parts of furniture (821). EU-destined exports of these product groups account for 61 percent of total exports of parts (or 9 percent of total exports of manufactures excluding chemicals to the EU). For comparative purposes, Table 13 also reports HTS indices for Turkey, Mexico vis-à-vis the United States, and Malaysia for its trade with East Asia.

By this measure, all countries (except Hungary, though its HTS index remains relatively high) have increased trade turnover in parts with the EU. Some, however, from very low levels in 1993 (Latvia and Lithuania). The largest gains recorded Estonia, Romania and Slovakia.

Slovenia—the most developed economy among CEEC—has the most active horizontal links with the EU.¹³ The Czech Republic and Estonia rank second and Hungary third in terms of the values of the HTS index.¹⁴ Except Latvia and Lithuania other CEECs have more intensive

¹³ Although its HTS for most part categories declined between 1993, the overall HTS index increased because of the increase in motor vehicle parts (784). Vehicle parts account for more than 50% of exports and 20% of imports in total parts.

¹⁴ The index for Hungary declined, but this may be due to its growing specialization in assembly operations at a higher level of production fragmentation. For instance, HTS index for piston engine parts fails to

horizontal links with the EU than Mexico with its NAFTA partners. In individual product groups, the HTS indices for CEEC trade with the EU are relatively high when compared with Turkey and Mexico—they are, however, mostly lower than for Malaysia's trade with East Asia.

The HTS indices for CEECs as well as for comparator countries significantly vary by a product group. The values of HTS indices are high for furniture parts for all countries including Turkey, Malaysia and Mexico. The exception is Slovenia with imports accounting for 28 percent of the value of exports to the EU. High levels of horizontal trade specialization can be also observed in switchgear parts for all countries except Latvia, Lithuania and Malaysia.

In other groups the situation is more diversified. Bulgaria and Slovakia seem to be highly involved in various stages of the furniture production process. Czech Republic and Slovakia specialize in automotive industry (piston engine parts and motor vehicle parts). Poland has the highest value of HTS index for engine parts. The Czech Republic also has together with Hungary the highest HST index for office equipment parts, which is, however, well below of that for Mexico. Most other CEEC have low HTS with the exception of Estonia, Slovakia and Slovenia.

§ The largest dispersion is in telecommunication parts. The values of HTS indices for only three CEEC—Estonia, Hungary and Slovakia—fall in between the range set by Malaysia (0.86) and Mexico (0.47). The index for Estonia's trade in telecommunication parts is the highest among CEEC, but still considerably lower than that for Malaysia in trade with East Asia.

5.2. Integration into global networks of production and marketing

Since HTS only addresses the extent of mutual trade in a category of parts, it can only confirm or rebuff the suspicion that the increase in trade in parts has been due to production fragmentation. If its value is zero, one may suspect that there is no production sharing. There is one caveat, however. A part may be used in the assembly of a component or final product. Furthermore, if the value of the HTS index is close to unity indicating two-directional flows roughly equal in terms of value, these may merely indicate flows servicing different production processes not necessarily linked to production sharing.

Hence, one has to go a step further by examining developments not only in trade of parts but also that in components (i.e., those products that are not designated as parts in SITC. Rev. 2) as well as that in final products. A country may specialize, for instance, in the assembly of TV receivers. While the 'import' RCA should then indicate revealed comparative advantage in parts, this would not be captured by the HTS index. Neither would it provide evidence as to local firms'

capture exports of piston engines assembled for Volkswagen-Audi in Hungary (see Section 6.2). Note also a dramatic decline in HTS index of parts for furniture whose value fell from 0.90 in 1993 to 0.54

participation in production sharing. Leaving aside data available only at the level of firms, the only other source of information is data on trade in components and final products. If there are significant exports of, say, TV tubes or TV receivers, it may indicate participation of local producers in global networks of production and distribution.

On the basis of our analysis of trade in parts, we identify three major networks—automotive network, office equipment and automatic data processing machines jointly analyzed with telecommunication equipment (hereafter ‘information revolution’ network) and furniture network. The data examined so far indicate that at least some CEEC seem to actively participate in them for two reasons. Consider first that product groups (parts, components and final products) falling into these networks increased their share in CEEC-10 exports of manufactures (excluding chemicals) to the EU from 17 percent in 1993 to 26 percent in 1997 and 31 percent in 1998. The share of CEEC-10 exports in EU-external imports of these products also increased from 2.2 percent in 1993 to 4.4 percent in 1997 and 6.6 percent in 1998.

Second, trade in parts and components of these networks dramatically expanded over 1993-1997. With the value of these exports increasing from US \$1,131 million in 1993 to US \$5,765 in 1998, their share in EU-external imports grew from 1.6 percent in 1993 to 5 percent in 1998. Imports of parts also increased almost four times from US \$2,395 million in 1993 to US \$9,462 over 1993-98.

We shall begin with automotive industry which accounts for the largest share of exports of parts by highly developed countries (26%) and then turn to telecommunications (18%) and office machinery (14%) ranking correspondingly second and third.¹⁵ The parts of the ‘information technology’ networks have driven foreign trade of highly developed countries—exports of office machinery displayed the fastest annual growth of 15.9 percent over 1978-95, followed by telecommunications growing at 11.5 percent over this period (Yeats, 1998). Since exports of furniture played an important role at least during the early stages of transition from central planning, we shall also review developments in these special networks usually run by large retailers in the EU. In contrast to car manufacturing, which usually involves either foreign greenfield investment or equity investment, participation in furniture networks derives from outsourcing.

in 1997.

¹⁵ See Table 5 in Yeats (1998)

5.3 Automotive network

Globalization based on production fragmentation has been the major driving force behind transformation of auto industry worldwide in the 1990s. It has also deeply affected the ways in which this sector has changed in CEEC. Before the collapse of communism some CEECs produced cars most notably former Czechoslovakia with a strong tradition going back to the inter-war period. Others had manufactured cars on the basis of foreign licenses (e.g. Fiat in Poland, Renault in Romania). None of them, however, had been incorporated into global networks of respective multinationals. Czech Skoda, Polish Fiat, Romanian Dacia or Soviet Lada (a modified Fiat model) were marketed in Western Europe but with not much success despite their low prices. Poor quality, outdated design and lack of marketing and service infrastructure were probably major impediments.

Following the collapse of central planning, CEEC governments have actively sought strategic partners for their existing auto producers and frequently offered market protection in exchange for foreign investment in this sector. Indeed, without infusion of technology and marketing know how, chances of survival, not to mention expansion, were slim at best. Some others (e.g. Hungary, which only produced buses but not passenger cars) keen to attract FDI responded favorably to foreign firms willing to establish their manufacturing operations (see Box 1). Not all countries, however, followed the path of offering subsidies to large multinationals in the guise of market access restrictions. Baltic states, which did not inherit automobile plants, decided instead to open their markets to cars, while aborted or derailed transition in Bulgaria and Rumania in 1992-96 effectively kept away foreign investors.

Restructured automotive industry has become a major player in trade with the EU for the Czech Republic, Hungary, Poland, Slovakia and Slovenia. These five countries accounted in 1998 for 99.6 percent of all exports of motor vehicles from the region and for 97 percent and 95 percent of exports and imports of parts and components respectively. But they accounted for 'only' 82 percent of EU exports of motor vehicles to CEEC-10.

In 1998 motor vehicles and parts accounted for 19 percent of the Czech EU-oriented manufactured exports, 24 percent of Hungarian exports, 12 percent of Polish manufactured exports, 34 percent of Slovak exports and 22 percent of Slovenian exports to the EU. For all these countries, exports expanded faster than the average increase in exports of manufactures to the EU. The largest growth recorded the automotive network in Slovakia (its share was merely 4% in 1993) and Hungary (5% in 1993). It is also noteworthy that the share of these exports in Bulgarian manufactured exports contracted, although from a very low level in 1993, and slightly increased in Romanian exports. On the import side, these shares were smaller for all countries

except Poland (13%): Czech Republic – 13 percent; Hungary – 15 percent; Slovakia – 23 percent; and Slovenia – 20 percent (Table 14).

The growth of trade in motor vehicles and parts including such components as piston engines, electrical equipment, etc. has been spectacular.¹⁶ The total value of CEC-10 exports from automotive network increased from US \$1.4 billion in 1993 to 10.1 billion in 1998 (Table 14).

Table 14: Motor Vehicle EU-based networks, 1993 and 1997-98 (in million of US dollars)

		Exports			Imports			Network's		Memo: Share of	
		Final Products	Compo-nents	Parts	Final Products	Compo-nents	Parts	Exports	Imports	Exports in manufactures exports to EU	Imports in manufactures imports from EU
Bulgaria	1993	9	1	3	131	2	24	12	157	1.6	12.0
	1997	9	1	7	114	3	26	17	143	1.0	8.3
	1998	7	1	8	179	3	29	16	211	0.9	9.6
Czech Rep.	1993	382	7	87	487	13	162	476	663	9.1	9.2
	1997	1,088	37	569	1,102	187	738	1,693	2,028	14.7	12.9
	1998	1,856	106	869	916	279	883	2,831	2,078	19.3	12.5
Estonia	1993	1	0	0	46	1	4	1	51	0.7	24.7
	1997	1	0	5	227	4	48	7	279	0.7	13.2
	1998	3	0	7	202	5	41	10	248	0.8	10.1
Hungary	1993	20	107	60	638	28	178	188	843	4.6	12.6
	1997	300	1,632	417	734	110	1,563	2,350	2,407	20.9	17.9
	1998	525	2,456	556	1,037	93	1,218	3,537	2,347	24.1	15.2
Latvia	1993	2	0	0	83	1	9	3	93	1.6	27.4
	1997	1	0	1	143	3	44	2	189	0.4	15.0
	1998	3	0	1	177	4	25	4	206	0.6	13.6
Lithuania	1993	2	0	0	80	1	15	3	95	1.2	23.5
	1997	1	0	1	228	3	86	2	317	0.2	16.0
	1998	3	0	1	227	7	39	4	272	0.3	13.0
Poland	1993	536	4	71	950	98	320	610	1,368	9.2	13.2
	1997	1,073	28	354	1,719	246	1,728	1,454	3,693	11.7	15.1
	1998	1,217	29	461	1,622	290	1,430	1,706	3,342	11.8	12.5
Romania	1993	10	0	4	143	5	21	14	169	0.8	7.5
	1997	12	1	43	176	16	41	57	233	1.2	4.7
	1998	10	1	51	368	17	44	63	429	1.2	6.9
Slovakia	1993	43	1	8	73	2	34	52	109	3.8	6.8
	1997	515	1	221	316	85	410	737	811	18.7	16.9
	1998	1,654	1	265	294	226	828	1,919	1,348	34.4	23.4
Slovenia	1993	303	33	95	427	65	265	430	757	12.7	21.4
	1997	655	60	135	676	174	309	849	1,159	17.4	19.3
	1998	904	66	190	652	240	390	1,160	1,282	21.6	20.2
Ceec-10	1993	1,004	121	234	2,631	150	767	1,359	3,548	6.6	11.7
	1997	3,001	1,700	1,617	4,759	656	4,685	6,318	10,100	13.2	14.3
	1998	5,278	2,594	2,218	5,022	924	4,537	10,090	10,482	17.0	13.3

Source: Derived from EU trade data as reported to the UN COMTRADE database.

¹⁶ See Table 1 for the list of parts, components and final products included in the automotive network.

In 1998 export earnings from sales of network products in EU markets accounted for 17 percent of the value of EU-oriented exports of manufactures up from 7 percent in 1993. Exports outpaced the growth in imports: While in 1993 export earnings covered 38 percent of import expenditure of the network, this ratio increased to 63 percent in 1997 and 96 percent in 1998. Exports of parts and components, which increased from US\$ 355 million in 1993 to US\$ 3.3 billion in 1997 and US\$ 4.8 billion in 1998 were mainly responsible for the growing role of the network in generating export earnings. Last but not least, this dramatic change was not the result of import restrictions, as these were subject to commitments to the EU under the European association framework, but triggered by the expansion in exports. Their share in imports of these countries of manufactures from the EU rose slower from 13 percent in 1993 to 16 percent in 1997.

Hungary has recorded the most vigorous development indicating a very fast integration into EU-based automotive networks of production and marketing. Although—except for buses—it did not have an indigenous passenger car manufacturing industry and production of car parts was negligible before the collapse of central planning, Hungary became in 1988 the largest exporter of automotive network among CEEC and second largest importer of parts and components after Poland. Hungary accounts for 35 percent of CEEC-10 exports of automotive products up from 14 percent in 1993. Its share in EU-external imports of parts tripled from 0.3 percent in 1993 to 0.9 percent in 1997 and 1.1 percent in 1998. Most impressive was the increase in trade in piston engines and their parts: Hungary's share in EU external imports of these items soared from 2 percent in 1993 to 18 percent in 1997 and 24 percent in 1998. Hungary accounted for 12 percent of EU total external exports of piston engine parts (SITC. 7139) in 1998 (see Appendix Table 5).

FDI have been responsible for establishing production capacities and linking them to international supply chains (see Box 1). Since 1994 the largest Polish exporter to the EU has been Fiat, which assigned the production of one of its models to its factory in Poland. The largest exporter in Hungary is Audi/Volkswagen producing piston engines for Audi cars manufactured in Germany and elsewhere. The share of piston engines (almost exclusively manufactured by the Audi plant) in Hungarian EU-oriented exports of manufactures 16 percent up from 14 percent in 1997 and mere 2 percent in 1993. These exports accounted for around two-thirds of Hungarian automotive exports to the EU in 1998. Czech Skoda has become part of the VW group producing in 1998 producing around 400,000 passenger cars (Meyer 2000). The 80 percent increase in

Box 1: FDI and motor vehicles networks

FDI by major manufactures of cars has restructured automotive industry in 5-CEECs (van Tulder and Ruigrock 1998). Most automakers came from the EU including such US subsidiaries there as GM's Opel or Ford. The EU companies with highest investment and sales in the region are Germany's VW (Volkswagen) and Italy's Fiat followed by Germany's GM Opel and France's Renault. VW's biggest investment is in the Czech Republic. Skoda Auto, part of the Volkswagen Group, is already the largest firm in the Czech Republic and the largest exporter accounting for 7 percent of Czech exports to the EU in 1997. Among top 100 Czech Republic companies there are also other foreign-owned firms including the Karosa bus-maker (Renault), ranked 97, and Daewoo at Avia, ranked 59 in 1997. ("Top 100 Czech Republic Companies," in *The Wall Street Journal Europe's Central European Economic Review*, vol. VI, no. 6, July and August 1998.) Exports of Karosa buses in which Renault invested US \$18 million, increased more than seven times between 1995 and 1996. Exports of lorries and trucks, which also attracted FDI, grew over this period by 173 percent to US \$98 million.

VW also assembles models in Poland and Slovakia. It produces parts (gearboxes) in Slovakia and manufactures engines in Hungary. VW opened a new plant in Poland in 1999 (August) that will manufacture Diesel engines with the projected value of annual exports above US \$1 billion. Fiat's largest operation is in Poland—Polish Fiat became the largest Polish exporter to the EU already in 1993.

However, not all major investors are from the EU, as prospects of future unfettered access to EU markets have offered an extra incentive to move in. Japan's Suzuki has established an assembly plant in Hungary, which started producing mid-size cars in 1992 (Tutak 1999). Isuzu Motors (Japan) began recently producing diesel engines in Poland. Korean automakers—Daewoo, Hyundai and Kia—have also rushed in with Daewoo becoming the major player. Daewoo has bought state-owned auto plants—four in Poland, one in the Czech Republic and one in Romania.

Hence, an interesting question is whether production links emerged between CEEC and recipients of non-EU FDI in auto industry. The problem in answering this question is that the Korean 'blitzkrieg' into the region's automotive industry occurred only a few years ago. Integration into production and marketing usually has longer lead times.

Nonetheless, the analysis of trade in motor vehicle parts of Hungary with Japan (Suzuki has been in operation there since 1992) and Poland's trade with Korea (Daewoo began its Polish operations in 1996) provides some relevant information. One feature seems to stand out. So far this has been a one-way operation—FDI have not triggered exports to a home country. Hungary's imports of parts (SITC 784) grew from US \$3 million in 1992 to US\$ 30 million in 1996 and US\$ 80 million in 1997. The value of Hungary's exports was below US \$1 million in 1997. So was the value of Hungarian exports of motor vehicles (US \$0.6 million in 1997). Polish imports of vehicle parts jumped from US \$2 million in 1995 to US \$201 million in 1997. Its exports amounted to US \$50,000 in 1997. On the other hand, probably because of restrictions in access to Hungarian and Polish markets, exports of motor vehicles were relatively low—Japan exported to the tune of US \$85 million to Hungary and Korea's exports were US \$62 million in 1997.

Thus, in contrast to the bulk of investment from the EU car manufacturers, the Asian involvement in CEEC does not seem to be driven by the logic of production fragmentation. It appears to have been so far a classic example of tariff jumping type of investment. Their impact may however go beyond that. The Polish press recently reported that Daewoo's plant would provide its Polish operation with crankshafts. When it happens, intra-CEEC trade will grow. Asian multinationals may accomplish something that had eluded CMEA planners for forty years of its existence—the development of horizontal links among plants in CEEC.

Czech sales of motor vehicles (SITC. 781) in EU markets in 1998 was largely attributable to exports of “Octavia” model firmly entrenched into a global VW-platform.¹⁷

Assuming that domestic firms perform assembling operations of a product to be marketed abroad, the value of exports of a ‘final product’ (i.e., motor vehicle) or a component (e.g., piston engine) should exceed the value of imports of parts and/or components. If the final product is assembled for domestic consumption, relatively high imports of parts and components will boost the value of “import” RCA index. On the other hand, “surplus” in trade of a given part is also an indicator of specialization within a network. Correspondingly, one would then also expect that a country should be at a comparative advantage in sales of this product or a component in EU markets.

How do CEEC perform according to these yardsticks? Taking first the extent to which export earnings (aggregate value of exports of final products, components and parts) of a network pay for imports of parts and components, only four CEEC were in red in 1998. The ratio of export earnings to imports was below 100 percent for Bulgaria and three Baltic economies: Since there is no automotive industry in these countries, this comes as no surprise. Export revenues of other CEEC were several times higher than imports with the exception of Poland when export revenues were roughly equal to import expenditures in 1998. This marked a significant turnaround in comparison to 1997—export earnings covered then 77 percent of the value of imports. Until then Poland seemed to rely mostly on assembling motor vehicles including piston engines from imported parts for domestic consumption rather than for shipments within the respective network.¹⁸

Calculations of ‘export’ RCA indices for both final products and parts and components and ‘import’ RCA indices for parts and components shed further light on respective areas of specialization of CEEC in 1998 (Table 15). They tend to specialize in production of components and parts rather than final products, although they are two exceptions. Slovakia and Slovenia appear to have comparative advantage in production of motor vehicles (SITC. 781) and Slovenia also in production of trucks (SITC. 782). These lines of specialization consist in large part of assembly operations, as the value of ‘import’ RCA index for parts and components was above unity for both Slovakia and Slovenia. At a more disaggregated level, note that both Slovakia and Slovenia have “import” comparative advantage in the same categories of components and parts

¹⁷ Czech exports to the EU increased from US\$ 281 million in 1993 to US\$ 921 million in 1997 and 1,654 in 1998.

¹⁸ However, this has been a ‘policy-induced’ advantage due to high tariffs and other subsidies provided to investors in this sector (Kaminski 1999).

(marked in bold italic in Table 15). Two other countries—Czech Republic and Poland—have comparative advantage in assembly operations, i.e., the values of “import” RCA indices were above unity in 1998. Czech Republic imported significant amounts of ignition starting equipment, piston engines and motor vehicle parts while Poland relied on significant imports of piston engines and motor vehicle parts.

Table 15: RCA Indices of products in automotive network, 1998

	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN
	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998
781 pass motor veh. exc. buses	0.00	0.98	0.00	0.30	0.02	0.01	0.52	0.01	2.57	1.24
782 lorries, special motor veh. nes	0.01	0.38	0.05	0.00	0.04	0.05	0.99	0.01	0.01	1.03
783 road motor vehicles nes	0.22	0.34	0.07	0.11	0.03	0.06	0.17	0.01	0.03	0.18
722 tractors non-road	0.01	0.92	0.03	0.02	0.31	0.12	0.67	0.21	0.25	0.07
74411 fork lift trucks etc	0.79	0.05	0.03	0.01	0.07	0.10	0.02	0.04	0.21	0.07
Components										
77831 ignition, starting equip	0.03	0.20	0.04	2.08	0.07	0.00	0.14	0.01	0.03	2.68
77832 elect. Vehicle lighting equ	0.02	2.32	0.02	0.82	N.A.	0.05	0.55	0.01	0.03	1.75
7132 motor vehc. piston engines	0.02	0.10	0.00	13.94	0.00	0.00	0.01	0.01	0.00	0.02
71623 gen sets with piston engines	0.09	0.02	0.01	0.01	0.03	0.21	0.56	0.17	0.02	0.09
Parts										
784 motor veh parts, acces nes	0.06	1.01	0.09	0.54	0.02	0.01	0.47	0.16	0.86	0.58
7139 piston engine parts nes	0.15	0.66	0.03	1.12	0.02	0.00	0.93	0.09	0.14	0.51
Motor vehicles exports	0.03	0.85	0.02	0.24	0.03	0.02	0.57	0.01	1.99	1.11
Motor vehicles parts & comp exports	0.06	1.01	0.09	0.63	0.02	0.02	0.46	0.15	0.78	0.72
Components & parts imports										
	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998
77831 ignition, starting equip	0.17	1.30	0.22	1.17	0.22	0.36	0.36	0.25	1.24	1.05
77832 elect. Vehicle lighting equ	0.14	0.83	0.24	0.69	0.30	0.31	0.40	0.12	1.38	1.38
7132 motor vehc. piston engines	0.02	1.09	0.01	0.09	0.02	0.01	0.81	0.11	3.08	3.05
71623 gen sets with piston engines	0.85	0.70	1.04	0.36	2.38	2.38	1.69	1.27	0.63	0.80
Parts										
784 motor veh parts, acces nes	0.24	1.20	0.32	0.77	0.32	0.35	1.25	0.14	3.32	1.43
7139 piston engine parts nes	0.57	0.60	0.45	7.63	0.55	0.72	0.56	0.20	0.43	0.31
Motor vehicles imports	0.63	0.42	0.60	0.50	0.89	0.83	0.47	0.44	0.38	0.77
Motor vehicles p&c imports	0.24	1.18	0.32	0.78	0.34	0.37	1.16	0.16	3.07	1.40

Source: Computations based on EU data from UN COMTRADE Statistics.

Specialization in exports of motor vehicle parts and components suggest that the Czech automotive sector is more developed than in Poland and other CEEC. Even though production and exports of parts and components have been rapidly growing in most CEEC, only exporters from the Czech Republic have an overall value of “export” RCA index above unity. Such other countries, however, as Hungary and Slovenia are in comparative advantage in selected EU markets for automotive parts and components. In addition to piston engines and parts, Hungary

also specializes in ignition equipment for cars (SITC. 77831) in which Slovenia has also comparative advantage. Czech Republic has the value of RCA above unity for vehicle parts (SITC. 784) and together with Slovenia for lighting equipment (SITC. 77832).¹⁹

Larger number of CEEC has the values of 'import' RCA for components and parts exceeding unity that usually indicates participation in transborder production chains as well as the existence of assembly operations in a country. In addition to CEEC with "export" comparative advantage in production of selected parts and/or components (Czech Republic, Hungary and Slovenia) the values of "import" RCA exceed unity for Estonia's, Poland's and Slovakia's imports of parts and components.

5.4. Information revolution' networks: office equipment and telecommunications

Over the last two decades the fastest growing exports of highly industrialized countries were parts and components of office machinery and of telecommunication equipment. Between 1978 and 1995 their compound growth rates in terms of value were respectively 16 and 12 percent (Yeats 1998). This is hardly surprising as they embody hardware of the current information revolution. Office machinery includes on the one hand such items as computers, central processing units, photocopiers, data processing devices, etc., and on the other hand, parts and accessories used in their production. Parts of TV monitors, radio broadcast receivers, sound recorders, loudspeakers, transmitters, TV cameras, remote control devices, etc. fall into telecommunication equipment. Since these products epitomize information revolution, we shall refer to them as 'information revolution' networks.

Office equipment machinery network

Trade turnover in the office machinery equipment group (SITC Division 75) increased from US\$1.3 billion in 1993 to US\$4.1 billion in 1997 and with trade in parts growing from \$400 million to more than US\$1.5 billion. The growth in turnover was mainly the outcome of expanding exports of both final products and parts—the former grew 991 percent, the latter increased 787 percent. Together they accounted for 68 percent of the increase in turnover between 1993 and 1997. Considering that the increase in imports of parts contributed another 25

¹⁹ VW-Skoda suppliers appear to have contributed significantly to the growth in Czech exports of parts and components. These were coached into restructuring by VW—OECD (1998, p. 66) reports that by 1997 67 percent of suppliers obtained superior ratings for quality and timeliness of delivery and many became suppliers of parts to other VW plants abroad. The share of Czech exporters in EU-external imports of parts and components rose from 0.26 percent in 1993 to 1.12 percent in 1997 and 1.43 percent in 1998. The increase in the share of motor vehicles was smaller over 1993-97—this share rose from 0.5 percent to 0.9 percent. But it jumped to 1.4 percent in 1998.

percent to the increase in turnover, it is tempting to conclude that CEEC have begun entering these high value added areas of production.

But in fact only a few among CEEC have. The only stellar performers have been Estonia and Hungary jointly responsible for 73 percent of the increase in trade turnover (both final products and parts) and 76 percent of the increase in trade in parts. The growth was particularly impressive in exports of parts: their aggregate share in CEEC exports of these products to the EU rose from 20 percent in 1993 to 70 percent in 1997 and 73 percent in 1998. The share of Estonia in EU external imports of office machinery parts rose from 0.001 percent in 1993 to 0.52 percent in 1997 and fell to 0.36 percent in 1998, whereas that of Hungary increased from 0.1 percent to 1.7 percent and 2.5 percent in 1998 (Appendix Table 6). Although the Czech Republic still holds the dominant position in CEEC exports of office machinery equipment to the EU (accounting for 49 percent in 1998 down from 58% in 1997 and 79% in 1993), Hungary has become the largest CEEC exporter of parts. Hungary's share grew from 20 percent in 1993 to 53 percent in 1997 and 63 percent in 1998, while the Czech share fell from 55 to 22 and 17 percent. So did the share of Czech exports in EU imports of office machinery—it fell from 2.2 percent in 1993 to 0.7 percent in both 1997 and 1998. Last but not least, Estonia and Hungary are the only CEEC with the value of 'import' RCA for parts exceeding unity indicating involvement in production sharing.

Hungary has dramatically expanded its trade in office equipment and parts, whereas Estonia only in parts. Their combined share in exports of parts from CEEC-10 increased from 20 percent in 1993 to 72 percent in 1997 with Estonia contributing 9 percent to CEEC-10 exports of parts. The share of Hungary in CEEC-10 exports of final products grew from 6 percent in 1993 to 27 percent in 1998, in exports of parts from 20 percent to 63 percent, and in imports of parts from 23 to 55 percent over the 1993-98 period.

Thus, Estonia's and Hungary's entry into global networks of multinationals producing 'office machinery equipment' have determined developments in CEEC trade with the EU over 1993-98 (Table 16).²⁰ There are, however, some indications of the potential for future growth in Latvia, Lithuania, Romania and Slovakia. The share of this product group (both parts and final products) in manufacture exports significantly increased albeit from very low levels.²¹ So did

²⁰ As in automotive production sharing, multinational corporations have probably played a pivotal role in integrating Estonia and Hungary into production and distribution networks of office equipment. For instance among 20 largest firms in terms of sales in Hungary in 1997, one may find at least two MNCs that run these networks. These include the second largest company IBM Storage Products and twelfth-ranked Philips.

²¹ In Latvia's exports from 0% to 0.3%, Lithuanian exports from 0 to 1%, and in Slovakia's exports from 0.1 to 0.4%.

their respective shares in EU-external imports (see Appendix Table 8). Bulgaria and Slovenia recorded little, if any growth at all—their shares in EU-external imports of both office equipment and parts significantly contracted over 1993-98.

Table 16: Office machinery equipment EU-based networks, Czech Republic, Estonia, Poland, Hungary and total CEEC-10 (in million of US dollars and percent)

Commodity & Parts	Czech Republic		Estonia		Hungary		Poland		CEEC-10	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Exports of final products	18.6	5.2	0.0	0.2	1.4	2.9	0.8	1.1	23.6	10.6
Exports of parts	27.9	116.3	0.1	63.9	10.0	432.2	3.6	17.9	50.7	687.4
Imports of parts	129.0	226.1	1.3	26.8	80.4	734.9	68.2	191.4	347.5	1,343.5
Exports of final products minus imports of parts	-110.4	-220.9	-1.3	-26.6	-78.9	-732.0	-67.4	-190.3	-323.9	-1,332.9
Imports of final products	31.9	19.4	0.4	3.9	25.7	29.0	21.6	63.3	105.6	149.2
Memo:										
Share in EU-oriented exports of manufactures (%)	0.9	0.9	0.1	5.2	0.3	3.0	0.1	0.1	0.3	1.1
Share in imports of manufactures from the EU(%)	2.2	1.2	0.8	1.3	1.6	4.9	0.9	1.0	1.3	1.7
Overall Balance	-114.4	-84.4	-1.6	33.4	-94.6	-328.8	-85.4	-235.7	-378.8	-794.7

Source: Computations based on EU data in UN COMTRADE Statistics.

CEEC-4 import significantly more parts from the EU than they export final products to EU markets. The latter are negligible. Imports of parts in terms of value rose from US\$279 million in 1993 to US\$750 million in 1998. An almost nine-fold increase in the value of exports of parts combined with a contraction in exports of final products suggests the expansion in intra-product specialization.

But there are significant differences in emerging specialization among CEEC within 'office machinery equipment' network. Bulgaria, Czech Republic and Slovenia have a "double" comparative advantage in typewriter parts (on the import side) and typewriters (on the export side), which suggests their involvement in assembling typewriters (7511) for EU clients.²² So does Hungary. Its "double" comparative advantage in both aggregate exports and imports of parts for calculating/accounting machines (SITC. 7599) implies integration into intermediate stages of a supply chain. The share of Hungary in EU external imports of SITC. 7599 grew from 1.9 percent in 1997 to 2.7 percent in 1998 and in EU external exports from 2.6 percent to 4.4 percent respectively. Other CEEC, except Latvia and Slovakia, have comparative advantage in assembly of office machinery, but they do not seem to be involved in global networks of production and distribution. Their shares in EU external imports and exports remain negligible.

²² Their share in EU external imports of typewriters (SITC.7511) fell from 0.5 percent (Bulgaria) and 9 percent (Czech Republic) in 1997 to 0.4 percent (Bulgaria) and 3.6 percent (Czech Republic) in 1998 (Appendix Table 7).

In all, only Estonia and Hungary have made large strides among CEEC in developing production capacities within the 'office machinery equipment' network. Their trade profiles seem to suggest different patterns of specialization. Hungary has comparative advantage in both assembling and the manufacture of parts, whereas Estonia only in the latter. This may suggest that Hungarian firms are more involved in a larger number of stages of production including both the manufacture of parts and the assembly of final products. Note also that Hungary's imports of final products fell in terms of value. It is thus likely that assembled final products have had import-substitution effect. Indeed, the share of Estonian parts in EU external imports declined from 0.52 percent in 1997 to 0.36 percent in 1998 but in exports remained flat at 0.14 percent in both years.

Telecommunication and 'audio/visual' equipment network

Trade within the telecommunication and 'audio/visual' network expanded rapidly for all CEEC. Each country increased its share of both 'final' products and components in EU external imports, albeit most from very low levels (Table 17). EU exports to CEEC-10 also increased faster between 1993 and 1998 than to the rest of the world. Hungary is by far the largest exporter among CEEC accounting for more than half of aggregate CEEC exports of final products, components and parts in 1998. But some other countries are catching up despite an almost 40 percent increase in the value of Hungarian exports to the EU in 1998.

Table 17: Trade in telecommunications and recording equipment, 1993, 1997 and 1998 (million of US dollars and percent)

Commodity and parts	Czech Republic			Estonia			Hungary			Poland			CEEC-10		
	1993	1997	1998	1993	1997	1998	1993	1997	1998	1993	1997	1998	1993	1997	1998
Exports of final products	10	35	85	0	38	168	37	845	1,219	10	323	561	81	1,295	2,094
Exports of parts and components	20	107	142	2	50	46	186	314	394	74	280	276	299	881	1,024
Imports of parts and components	96	319	249	2	157	242	262	638	802	187	542	593	675	2,112	2,338
Final exports minus imports of parts/ components	-85	-284	-164	-2	-119	-74	-225	208	417	-177	-219	-32	-594	-817	-244
Final products imports	122	423	378	3	95	106	114	276	362	239	707	891	606	1,996	2,429
Memo: share (in percent) of															
Manufactures exports to EU	0.6	1.2	1.5	1.5	9.1	17.4	5.4	10.3	11.0	1.3	4.9	5.8	1.6	4.1	4.8
Manufactures imports from EU	3.0	4.7	3.8	2.3	11.9	14.2	5.6	6.8	7.5	4.1	5.11	5.5	3.8	5.4	5.6
Overall Balance	-188	-600	-400	-2	-165	-134	-153	246	449	-342	-646	-647	-901	-1,932	-1,649

Source: Computations based on EU data in UN COMTRADE Statistics.

Trade within the telecommunication and 'audio/visual' network account for a large and growing share in manufactures trade turnover with the EU for such countries as Estonia (17% in exports and 14% in imports), Hungary (11% and 7%) and Poland (6% and 6%). These shares considerably increased in 1998. The share of these countries in CEEC-10 exports to the EU increased from 89 percent in 1993 to 93 percent in 1998, while their share in imports was 81 percent in 1998.

While one may suspect that a fast increase in trade of this network has been induced by production sharing, it is impossible to draw a firm conclusion without a more detailed analysis of specialization patterns as revealed in values of "export" and "import" RCA indices. Estonia and Hungary seem to be firmly entrenched in EU-centered networks. Both countries have a "double" comparative advantage in both imports and exports of parts and components. Both countries seem to be involved assembly operations for exports. Hungary has "import" RCA above unity for five out of eight (or 7 excluding line telephone equipment) components and parts, and so does Estonia. Lithuania and Poland seem to be involved in production of TV tubes and Poland also in TV receivers. Again there are reasons to believe that the former are used as components in final products marketed by MNCs.

While in 1993 only Hungary had revealed comparative advantage in parts and components, by 1997 Estonia was in comparative advantage in EU markets for both final products and parts/components. Hungary lost this advantage in parts and components but gained it in final products, and Poland gained in final products (Appendix Table 9). No other CEEC had comparative advantage in either parts/components or final products in 1998.

Hence, only Estonian, Hungarian and to a lesser extent Polish firms appear to have become part of the EU-based 'audio/visual' network. There are several indications of it. These countries dramatically expanded their presence in EU markets over 1993-97 and in 1998. Estonian share in EU imports of final products rose from zero in 1993 to 0.17 percent in 1997 and 0.61 percent in 1998! Its share in EU imports of parts and components increased around ten-fold (from 0.018 to 0.18). The corresponding shares of Hungary in EU imports rose from 0.3 percent in 1993 to 3.9 in 1997 and surged to 4.5 percent and remained at 1.5 percent for parts and components in both 1993 and 1998. Poland's share in EU imports of final products rose from 0.1 percent in 1993 to 2.1 percent in 1998 and in parts and components from 0.6 to 1.1 percent.

Producers from Hungary and Poland have captured quite significant shares of various EU markets for this network's products. Hungary has become an important supplier of sound/recording equipment (762) with its share in EU imports rising from 1 percent in 1993 to 22 percent in 1997 and 30 percent in 1998. Polish producers accounted for 9 percent and Hungarian

ones for 6 percent of EU external imports of television receivers (761). Imports of TV tubes from Poland accounted for 13 percent of EU external imports in 1998.

Last but not least, the sheer number of parts and components in which Estonian and Hungarian values of 'import' RCA indices exceed unity testifies to their heavy presence in telecommunication and 'audio/visual' network. Out of eight product groups classified as parts or components, Estonia has 'import' comparative advantage in five groups and Hungary in four groups.

The analysis of trade developments gives support to the following observations. First, two countries—Estonia and Hungary—stand out in terms of integrating into the telecommunication and 'audio/visual' network. Second, except for Bulgaria, Romania and Slovenia, CEEC have made large strides in integrating into the telecommunication network. Consider that in 1993 only Estonia (in 'audio/visual' parts—7649), the Czech Republic and Poland (both in the production of TV picture tubes—7761) and Hungary in production of sound recorders (763) and 'audio/visual' parts (7649) were in comparative advantage in respective EU markets. In 1998 not only the number of countries has increased (to seven), but so has the number of product groups with the values of "export" RCA indices exceeding unity. Third, the new lines of specialization are mostly in components and parts. There are exceptions, however, suggesting active participation in the assembly of final products. These include Hungary specializing in a wide variety of product groups ranging from TV sets, broadcasting equipment and sound recorders and Poland specializing in TV receivers (761). The values of 'import' RCA indices for parts and components give further credence to their comparative advantage in assembling operations.

'Information revolution' network: an overview

Products groups of office machinery and telecommunication 'audio/visual' networks have been the most dynamic component of trade of highly developed economies. Since a number of product groups embody hardware of the ongoing revolution in information technology, these two networks put together can be called an 'information revolution' network. Since involvement in 'information revolution' networks can be regarded as a proxy for production sharing in sunrise industries, there are two interesting questions. How significant are products in these two groups in exports of CEEC-10 to the EU? How did their weight in trade with the EU change between 1993 and 1998?

Table 18 tabulates data relevant to these two questions. Total value of CEEC-10 'information revolution' exports to the EU increased eight-fold over 1993-98 from US\$455

million to US\$3.8 billion and that of imports almost four times from US\$1.7 billion to US\$6.3 billion. As a result, export earnings cover 61 percent of imports up from 26 percent in 1993. The share of these products and parts in EU-destined manufactured exports increased from 2 percent to 6 percent over this period. Their share in imports increased much less—from 5 to 7 percent. These data suggest that 'information revolution' sectors—both as inputs embodying high technology and production activity—are no longer marginal in CEEC-10 economies.

Table 18: 'Information Revolution' Networks in Trade of CEEC, 1993 (A) and 1998 (B), in million of US dollars and percent

Commodity & Parts	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Final products exports	5	12	29	90	0	168	38	1,222	1	2	0	7	11	562	6	6	2	8	14	27
Parts and components exports	2	6	48	259	2	110	196	827	0	3	0	36	78	294	1	23	5	136	18	19
Parts and components imports	19	54	225	475	3	268	342	1,537	7	34	6	39	256	785	60	165	48	214	56	109
Final exports minus parts/components imports	-14	-42	-196	-385	-3	-100	-304	-315	-6	-32	-6	-32	-245	-223	-55	-159	-46	-206	-43	-82
Final products imports	24	57	154	397	3	110	140	391	8	63	7	86	260	954	32	238	45	173	39	110
Memo: shares of information networks in (percent)																				
EU-oriented manufactures exports	1.0	1.0	1.5	2.4	1.5	22.7	5.7	14.0	0.6	0.8	0.3	3.6	1.3	5.9	0.4	0.6	0.5	2.6	0.9	0.9
In Imports (final & Parts) from EU	3.3	5.0	5.2	5.2	3.1	15.4	7.2	12.5	4.5	6.4	3.4	6.0	5.0	6.5	4.1	6.5	5.8	6.7	2.7	3.5
Overall Balance (US \$ million)	-35	-93	-302	-523	-4	-100	-248	121	-14	-92	-13	-82	-428	-863	-86	-374	-85	-243	-64	-173

Source: Computations based on EU data from UN COMTRADE Statistics.

But this is not so for all of them. In fact, there are significant differences among CEEC in terms of significance of this trade. First, the share of 'information' exports in manufactured exports is larger or equal to the average (6%) for CEEC-10 only for three countries—Estonia (17%), Hungary (12%), and Poland (6%). These three countries accounted in 1998 for 83 percent of aggregate CEEC-10 exports and 70 percent of their imports of parts and components.

Second, CEEC-10 tend to specialize in exports of parts and components rather than in exports of final products and import more parts than final product in terms of value. Exports of parts and components grew faster over 1993-97 than those of final products. There are, however, some exceptions. Hungary and Poland expanded exports of final products more than exports of parts and components in terms of value between 1993 and 1998.

Third, the share of both exports and imports in manufactured trade with the EU has been on the increase in CEEC-10, even though mostly from very low levels and at uneven pace. The most dramatic expansion experienced Lithuania (17 times), followed by Estonia (more than a ten-fold increase), Slovakia (4.6 times), Poland (3.7 times), and Hungary (2.2 times). Hungary, who

was the largest exporter among CEEC-10 already in 1993 accounting for 51 percent increased its share to 54 percent in 1998, while Estonia's share rose from 0.5 percent to 6 percent in the same period. Poland's share rose from 19 percent to 22 percent. While this trade increased in other CEEC-10 as well, other manufacturing sectors grew faster.

5.5. Outsourcing: furniture

Furniture is not a classic area of production fragmentation. Yet it possesses some characteristics of global networking. Producers are usually too small to conduct directly their sales in foreign markets. They have to become part of a supplier network of a large retail chain and often have to rely on parts supplied by firms designated by a retailer. Furniture producers in CEEC operate as suppliers to large retailers in the EU turning out product according to their specification and very often with provided by them parts. In brief, although overall this network has probably little production sharing, CEEC suppliers, if they want to export, have to be part of EU-based networks of marketing.

There are two arguments in favor of including the furniture networks. First, a huge increase in trade turnover of parts may be associated with production sharing. The value of CEEC-10 exports of parts increased from US \$300 million to US \$1 billion, or 250 percent between 1993 and 1998, while imports increased from US \$125 million to US \$388 million. One suspects that a large portion of these cross border flows relates to assembling operations with some parts destined for the EU for the final assembly and some shipped to CEEC-10 for further processing. Considering also that imports of parts from the EU increased less than CEEC-10 exports of parts, this seems to indicate the ongoing process of switching from the assembly of furniture to also producing parts.

Second, for most CEEC the furniture network has been a very important foreign currency earner (Table 18). The aggregate CEEC trade surplus in furniture network rose from US \$1 billion in 1993 to over US \$2 billion in 1998 with the value of exports increasing to US \$ 3.5 billion from US \$1.5 billion in 1993. For each country this network is a net foreign currency earner ranging between US \$1.2 billion (Poland) and US \$5 million (Bulgaria). Moreover, with a very rapid expansion in CEEC-10 exports of parts, the surpluses also considerably increased in 1998 for each CEEC except Slovakia.

Each CEEC managed to increase the value of exports of both final products and parts between 1993 and 1997, but in some they increased less than total EU-destined exports of manufactures (Bulgaria, Hungary, Lithuania, Romania and Slovakia). The most dramatic increase occurred in Slovenia with the share of 'furniture network' exports growing from 6 percent in

1993 to 9 percent in 1998. The largest increase occurred in parts with their share in EU-external imports of parts of chairs (82119) growing from 6 percent in 1993 to 50 percent in 1998 with the Czech Republic capturing 19 percent and Slovenia 16 percent of EU imports (Appendix Table 11).

Table 19: Trade in furniture, 1993 (A) and 1998 (B) (in million of US dollars and percent)

	Bulgaria		Czech R.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Final products exports	15	26	147	219	9	84	90	120	10	34	10	34	519	1,223	291	342	52	94	100	124
Parts exports	1	7	60	412	3	31	38	151	1	11	1	13	77	287	11	45	13	43	93	343
Parts imports	4	7	34	150	1	10	24	75	1	5	1	7	35	126	3	10	5	50	18	54
Final exports minus parts imports	11	19	113	69	8	74	66	45	9	29	9	27	484	1,097	287	332	46	44	83	70
Final products imports	20	21	94	123	3	34	93	114	9	26	9	22	85	187	11	36	17	36	22	110
Memo: share of (in percent) furniture exports in EU-oriented manufactures exports	2.2	1.8	3.9	4.3	7.9	9.4	3.1	1.8	6.6	7.1	4.2	4.0	9.0	10.5	16.1	7.7	4.8	2.5	5.7	8.7
Of final & parts in imports from EU	1.8	1.3	1.8	1.6	1.6	1.8	1.8	1.2	3.0	2.0	2.3	1.4	1.2	1.2	0.6	0.7	1.4	1.5	1.1	2.6
Overall Balance (US \$ million)	-8	5	79	358	8	71	11	82	1	14	1	18	476	1,197	287	341	42	51	153	303

Source: derived from trade data as reported by the EU to the UN COMTRADE database.

Slower growth in imports of parts from the EU than in CEEC-10 exports of parts may indicate an ongoing process of switching from the assembly of furniture to also producing parts. While the growing involvement in production of parts affects each CEEC, some have moved faster in that direction. In terms of the change in share of furniture parts in exports of total furniture exports, this appears to be the case of the Czech Republic, Latvia and Romania. Parts account for the bulk of total 'furniture' exports from Slovenia (70%) and from the Czech Republic (63%).

Another indication of integration of CEEC-10 into the EU-furniture manufacturing and distribution is the values of RCA indices in exports and assembly. With the exception of Romania, other CEEC-10 have a 'double' comparative advantage at least in one 'part' category and two or more 'final product' categories (Appendix Table 12).

6. 'NETWORKS' AND OTHER PRODUCTION SHARING ARRANGEMENTS IN EU-CEEC TRADE

How large is trade between CEEC-10 and the EU that can be attributed to 'dividing up the value chain' of production? It seems that most of trade falling within networks, which mainly

consists in vertical integration relates to fragmentation of production. But other arrangements based on horizontal arrangements are possible—consider for instance the supplier of an electric power generator that is subsequently installed in an electric plant. The supplier may be partly owned by a large MNC specializing in large engineering projects, e.g., ABB. While the supplier apparently operates within ABB-organized network, it is impossible to capture this trade without access to firm data. Furthermore, our definition of parts and components is rather narrow. We have not included all possible components or parts.

Yet, it seems that the 'network' analysis combined with a broader discussion of development in trade in parts provides a pretty good yardstick to gauge the significance of trade related to this finer division of labor. The discussed networks combined together cover most of trade in parts between CEEC-10 and the EU. The share of parts covered by these networks in total exports of parts amounted to 61 percent in 1998 and that in total imports of parts from the EU was 58 percent. The share of total networks' trade (total exports and imports of parts and components) in CEEC-10 trade turnover with the EU in manufactures excluding chemicals increased from 12 percent in 1993 to 21 percent in 1998 (Table 20).

Table 20: Aggregate trade in networks, value, composition and share in EU-external exports and imports, 1993 and 1998

	CEEC-10 (million of US dollars)		CEEC-10 (share in percent)		Composition of EU-external trade (in percent)		Share of CEEC-10 in EU-external imports	
	1993	1998	1993	1998	1993	1998	1993	1998
Exports								
Final Products	2,656	12,945	12.2	21.1	17.9	20.5	2.7	7.7
Components	295	1,125	1.4	1.8	3.0	4.6	1.8	3.0
Parts	836	4,640	3.8	7.6	9.2	7.5	1.7	7.5
TOTAL	3,786	18,711	17.4	30.5	30.0	32.6	2.3	7.0
Other parts and components	851	3,666	3.9	6.0	4.5	7.0	3.5	6.4
Memorandum: total of networks and other parts	4,637	22,377	21.3	36.5	34.5	39.6	2.5	6.9
Manufactured Exports (excluding chemicals)	21,794	61,301	100.0	100.0	100.0	100.0	4.0	7.5
Imports								
							Share of CEEC-10 in EU-external exports	
Final Products Imports	4,139	9,765	14.1	13.1	17.4	20.7	4.1	5.2
Components Imports	469	2,245	1.6	3.0	3.4	4.7	2.3	5.3
Parts Imports	1,926	7,217	6.6	9.6	8.5	6.2	3.9	12.9
TOTAL: final, comp. & parts	6,534	19,226	22.3	25.7	29.3	31.6	3.8	6.7
Other parts and components	2,009	6,645	6.9	8.9	3.7	17.5	9.3	11.2
Memorandum: total of networks and other parts	8,543	25,871	29.2	34.6	15.6	49.1	4.4	7.5
Manufactured Imports (excluding chemicals)	29,267	74,787	100.0	100.0	100.0	100.0	5.0	8.3

Source: derived from trade data as reported by the EU to the UN COMTRADE database.

The value of both aggregate exports and imports carried out within the networks significantly increased. The share of final products, components and parts in EU-destined exports of manufactures (excluding chemicals) increased from 17 percent in 1993 to 26 percent in 1997 and 31 percent in 1998, and that of imports from 22 to 26 percent in both 1997 and 1998. Their share in EU-external imports almost tripled from 2.7 percent in 1993 to 7.7 percent in 1998, expanding faster than their share in EU imports of manufactures without chemicals, which grew from 4 percent to 7.5 percent over 1993-98. Their share in EU-exports also increased significantly from 4 to 7 percent over the same period.

Trade in other parts and components also expanded rapidly between 1993 and 1998. Its share in EU-oriented exports grew from 4 to 6 percent and in imports from 7 to 9 percent.

There are other indications of progress in industrial restructuring as revealed in growing participation of CEEC-10 in intra-product division of labor organized around the EU. Note the convergence in change in the composition of trade of manufactures in CEEC-10 and the EU. The composition of both EU-oriented exports from CEEC-10 and imports from the EU has moved considerably toward those of the EU. The share of all products (i.e., final products, components and parts) of discussed networks in CEEC-10 trade in manufactures (excluding chemicals) increased from 20 percent in 1993 to 26 percent in 1997. This share in EU trade was 30 percent in 1993 and 33 percent in 1997. In the case of CEEC-10, however, dramatic increase in exports within networks was responsible for the increase—the share in exports increased from 17 percent to 26 over 1993-97. This seems to suggest that CEEC-10 have entered the same track as the EU in terms of evolving trade patterns within the discussed networks and trade in other parts and components..

However, not all CEECs have. There is a huge difference in the extent to which CEECs have become of this new division of labor driven by fragmentation of production. The difference is between first-tier EU candidates plus Slovakia and countries that were invited to accession negotiations in 1999. The former have obtained high levels of integration into the EU-based networks and experienced a very fast expansion of exports over 1993-98. The latter, excluding Lithuania witnessed the relative contraction of the significance of this trade. Bulgaria, Latvia, Lithuania and Romania have yet to make significant progress in becoming part of intra-product division of labor.

As can be seen from data in Table 21, the 'intra-product' exports accounted on average in 1998 for 35 percent for the first tier group plus Slovakia and only 8 percent for the second group. Moreover, the gap between the two groups dramatically increased between 1993 and 1998. Not that the average share of this trade for the first group was only 16 percent in 1993 as compared

with 11 percent for the second group. Top performers within the first group were Slovakia highly concentrated in the automotive sector followed by diversified Hungary and Estonia specializing in electronics. As for other countries of this group, the change was slower but significant.

Table 21: The share of “production fragmentation” exports to the EU in exports of manufactures (excluding chemicals) in 1993 and 1998 (in percent)

			Index 1998
	1993	1998	1993=100
Slovakia	10.2	41.8	409
Hungary	15.2	42.0	276
Estonia	12.5	34.2	274
Czech Republic	16.0	27.5	172
Slovenia	20.1	32.5	162
Poland	21.2	30.0	142
Lithuania	8.6	9.6	112
Latvia	11.2	8.9	79
Bulgaria	5.7	4.1	71
Romania	18.1	9.4	52

It is interesting to note that aggregate networks trade together with trade in other parts accounts for a growing share of trade in manufactures between the EU and CEEC-10. The value of CEEC-10 exports increased from US\$22 billion in 1993 to US \$61 billion in 1998 and their share soared from 17 percent to 31 percent over this period. Exports of parts and components grew from around US\$5 billion to US\$ 9 billion over the same period. On the import side, there was a discernible shift from imports of final ‘network’ products to imports of parts and components. The share of final network imports in manufactured imports from the EU fell from 14 percent to 13 percent, while the share of parts and components increased from 8 percent in 1993 to 13 percent in 1998.

CONCLUSION

Trade in parts as well as trade falling within ‘information revolution’, furniture and automotive networks has driven developments in trade in manufactures between CEEC-10 and the EU. The aggregate value of this trade (excluding imports of final products) increased from US\$6 billion in 1993 to US\$28 billion in 1998. It thus seems that the CEEC-10 economies have made large strides in readjusting their production structures to international markets, mainly those in the EU. Furthermore, with the same global forces driving developments in the EU and other industrial economies, developments in their trade in industrial products have lost their pre-transition idiosyncratic character.

The convergence in the composition of CEEC-10 trade in parts and components to that of the EU trade suggests that the catching up process is already underway. The composition of both EU-oriented exports of parts and components from CEEC-10 as well as imports from the EU has moved considerably toward these of the EU-external trade. In all, CEEC-10 economies appear to be on the same track as the EU in terms of evolving trade patterns within the discussed networks;

Country-by-country variation notwithstanding, many producers from CEEC-10 seem to have already become part of intra-product division of labor organized around the EU. This process seems to be particularly advanced in furniture (most CEECs), automobile industry (Czech Republic, Hungary, Poland, Slovakia and Slovenia) and has been gaining momentum in 'information revolution' networks (Estonia and Hungary);

Progress in industrial integration into EU has been uneven. Taking into account the significance of trade in parts and components, the share of trade with a 'double' comparative advantage as well as the significance of networks in their trade, one may distinguish between two groups. The first-tier CEEC-economies (Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia) have obtained high levels of integration. This trade accounts for between about one-fourth (Czech Republic) and one-third (Hungary) of their trade in manufactures with the EU. Bulgaria, Latvia, Lithuania and Romania—despite progress some of them have made (mainly Latvia and Lithuania)—appear to be much less integrated by these measures. The share of this trade varies between 4 percent (Bulgaria) and 10 percent (Lithuania and Romania—the latter down from 18 percent in 1993).

Another indication that the lower-tier countries (Bulgaria, Latvia, Lithuania and Romania) have not become part of intra-product division of labor is that—despite relatively low wages—they do not have comparative advantage in assembly in EU markets. In 1989 not a single CEEC had the revealed comparative advantage in assembling (i.e., RCA on imports) in 1989. Czech Republic, Hungary, Slovakia and Slovenia already acquired it in 1993 and by 1997 Poland and Estonia have also become specialized in assembly operations.

Among first-tier CEECs three countries stand out. Estonia and Hungary have achieved high levels of integration into 'information revolution' networks, whereas Slovakia has registered spectacular progress between 1993 and 1997 especially in restructuring of its automotive sector.

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STATISTICAL APPENDIX

Appendix Table 1: Composition of CEEC Trade with the EU in 'End-Use' Product Categories, 1989, 1993 and 1998

Country		\$ Million						As % of All Goods											
		All Goods			Food, Feeds & Beverages			Industrial Supplies Mat'l			Capital Goods (ex auto)			Consumer Goods (ex auto)			Automotive Veh. & Parts		
		1989	1993	1998	1989	1993	1998	1989	1993	1998	1989	1993	1998	1989	1993	1998	1989	1993	1998
CEC-10 /a	Exports	12,449	33,149	77,113	18.6	8.5	4.4	28.3	18.3	11.2	8.3	13.5	25.7	42.6	54.6	47.4	1.8	5.1	11.2
	Imports	11,755	40,711	99,157	10.5	9.4	5.4	6.1	6.1	4.6	29.5	28.3	32.2	48.2	46.0	47.6	5.8	10.2	10.1
Bulgaria	Exports	657	1,210	2,529	25.5	19.2	9.3	19.3	18.6	16.8	11.2	9.4	8.4	43.8	52.6	65.0	0.2	0.3	0.5
	Imports	1,851	1,748	2,675	7.4	16.1	8.8	6.5	8.1	6.1	37.2	22.3	24.3	45.2	44.4	52.7	3.6	9.1	8.1
Czech Rep.	Exports	n.a.	6,645	16,325	n.a.	4.5	1.9	n.a.	14.7	8.4	n.a.	16.3	27.6	n.a.	57.6	45.3	n.a.	6.9	16.7
	Imports	n.a.	8,260	18,802	n.a.	6.5	5.0	n.a.	5.2	4.9	n.a.	36.7	35.6	n.a.	43.5	44.7	n.a.	8.2	9.7
Estonia	Exports	n.a.	308	2,039	n.a.	5.9	3.6	n.a.	45.5	34.9	n.a.	4.3	20.4	n.a.	43.8	40.3	n.a.	0.5	0.7
	Imports	n.a.	339	2,965	n.a.	30.8	10.2	n.a.	6.1	5.7	n.a.	15.2	34.9	n.a.	33.1	40.9	n.a.	14.9	8.2
Hungary	Exports	3,705	5,773	16,672	25.8	16.0	6.3	17.9	11.4	5.5	10.9	18.5	48.2	44.7	51.9	33.5	0.8	2.1	6.5
	Imports	4,098	7,516	18,463	3.7	6.2	2.6	5.8	3.9	3.1	31.5	28.7	35.9	51.6	50.5	49.8	7.5	10.6	8.7
Latvia	Exports	n.a.	921	1,783	n.a.	2.1	1.9	n.a.	78.9	60.8	n.a.	0.8	2.6	n.a.	17.8	34.3	n.a.	0.4	0.3
	Imports	n.a.	481	1,989	n.a.	23.1	12.6	n.a.	3.1	8.1	n.a.	19.8	25.1	n.a.	35.5	44.0	n.a.	18.6	10.0
Lithuania	Exports	n.a.	877	1,663	n.a.	6.2	6.4	n.a.	65.2	22.3	n.a.	1.2	10.0	n.a.	26.6	60.1	n.a.	0.9	1.1
	Imports	n.a.	635	2,609	n.a.	30.3	12.3	n.a.	2.7	3.5	n.a.	16.5	25.6	n.a.	34.8	47.7	n.a.	15.7	10.8
Poland	Exports	5,181	9,955	18,287	20.4	10.1	6.8	32.4	22.2	14.0	7.9	10.9	17.8	36.0	50.6	52.2	3.2	6.2	9.2
	Imports	4,993	12,808	30,819	17.3	10.2	5.5	5.0	7.7	4.8	28.2	25.3	31.2	43.6	46.8	48.3	5.9	10.0	10.1
Romania	Exports	2,906	2,102	5,899	4.6	4.9	2.6	38.1	5.7	7.3	4.8	7.9	11.0	51.4	80.9	78.0	1.2	0.6	1.1
	Imports	813	2,872	6,985	10.7	13.6	5.9	13.4	5.3	3.5	9.4	29.5	29.3	65.6	45.1	55.0	0.8	6.4	6.2
Slovakia	Exports	n.a.	1,660	6,095	n.a.	3.5	1.3	n.a.	13.6	7.0	n.a.	11.7	19.8	n.a.	68.5	40.1	n.a.	2.8	31.7
	Imports	n.a.	1,840	6,388	n.a.	7.9	4.2	n.a.	5.2	3.5	n.a.	38.5	35.0	n.a.	42.3	39.7	n.a.	6.2	17.6
Slovenia	Exports	n.a.	3,698	5,821	n.a.	2.6	1.4	n.a.	5.4	6.2	n.a.	19.5	22.8	n.a.	60.8	50.2	n.a.	11.7	19.3
	Imports	n.a.	4,211	7,461	n.a.	6.9	5.7	n.a.	7.8	7.3	n.a.	21.3	25.1	n.a.	47.6	47.9	n.a.	16.5	13.9
Memo Items																			
Turkey	Exports	6,581	8,242	15,121	14.7	16.9	13.6	18.8	7.3	5.2	3.8	7.3	12.7	61.5	67.1	65.3	1.2	1.3	2.9
	Imports	6,464	14,306	23,424	5.3	2.7	2.9	9.0	8.4	5.8	35.9	36.3	37.9	43.0	40.3	40.7	6.8	12.4	12.0
Eur. Union	Exports	800,241	850,575	1,235,692	10.9	12.4	10.7	10.2	8.9	7.0	22.8	21.8	24.9	44.4	44.5	42.8	11.7	12.4	14.3
	Imports	804,650	893,121	1,315,128	11.0	12.3	10.4	9.8	8.4	6.6	23.9	23.3	26.5	43.0	44.1	42.5	12.2	11.8	13.8

Note: /a The 1989 data included only Bulgaria, Hungary, Poland and Romania.

Source: Computations based on partners' data from UN COMTRADE Statistics.

Appendix Table 2: Developments in CEEC Trade, 1989, 1993 and 1997

Country	Year	All Goods Exports To World (\$ Million)	As % of All Exports						
			All Manufactures.	Manufactures (Excluding chemicals)	Machines and transportation (Excluding Parts)	Parts	Non-Fuel Primaries	Fuels	All intermediate goods
Bulgaria	1989	3,045	68.7	55.2	33.4	4.6	24.4	5.3	37.3
	1993	2,317	60.3	48.8	8.0	2.2	32.3	6.0	60.2
	1997	4,035	67.7	51.6	8.0	2.3	27.3	4.6	62.4
Czech Repub.	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	9,645	80.2	72.5	17.6	6.4	13.4	4.7	62.5
	1997	19,499	86.2	77.8	22.1	14.0	9.1	3.3	69.6
Estonia	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	406	45.4	37.0	2.7	2.0	38.3	14.3	55.8
	1997	2,712	56.1	50.7	8.6	10.4	21.9	21.3	52.8
Hungary	1989	8,180	64.9	53.1	20.5	5.9	29.0	3.9	43.0
	1993	7,864	69.8	58.6	13.2	9.5	24.5	4.5	59.0
	1997	17,133	80.5	71.4	35.7	12.1	16.8	1.5	61.6
Latvia	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	1,083	23.9	17.4	1.2	0.5	25.3	50.1	37.2
	1997	2,938	38.1	31.8	6.3	1.4	27.0	33.0	47.2
Lithuania	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	1,201	28.9	20.4	3.0	0.3	24.6	37.7	32.0
	1997	2,658	59.5	49.8	11.0	1.7	23.7	16.6	48.6
Poland	1989	11,277	57.7	50.5	22.1	3.8	25.4	11.6	37.6
	1993	13,048	66.7	60.4	13.0	3.9	22.3	10.0	53.7
	1997	22,021	74.5	67.0	17.0	7.0	18.8	6.0	59.5
Romania	1989	6,933	69.3	57.9	17.7	2.2	12.2	17.3	43.4
	1993	4,253	83.3	74.9	11.7	2.2	10.7	5.3	50.6
	1997	7,867	80.4	72.8	8.3	3.7	14.2	4.3	49.3
Slovakia	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	4,425	79.5	67.7	11.5	6.7	14.0	5.3	68.2
	1997	8,245	84.4	73.5	18.2	10.1	10.8	4.3	69.8
Slovenia	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	5,134	89.6	83.0	18.2	9.0	9.1	0.5	61.3
	1997	7,127	90.6	80.4	21.2	12.4	8.6	0.2	71.2
Memo items:									
Turkey	1989	13,145	61.9	55.4	4.0	1.6	29.3	7.6	33.2
	1993	13,426	73.8	71.1	4.8	2.8	23.2	2.1	42.0
	1997	20,502	76.3	73.2	8.8	4.2	22.0	0.9	45.0
Malaysia	1989	29,236	46.6	44.4	23.8	5.8	37.5	14.6	62.6
	1993	54,576	68.7	66.3	36.6	11.2	21.1	9.1	59.8
	1997	86,642	79.0	76.1	43.5	15.6	12.4	7.3	62.2
Mexico	1989	36,563	59.1	54.8	26.1	12.7	16.3	20.1	50.4
	1993	50,686	70.7	66.9	32.2	16.2	11.4	14.2	51.2
	1997	106,239	77.7	74.2	37.9	14.7	9.1	10.0	49.1

Appendix Table 2 (continued): Developments in CEEC Trade, 1989, 1993 and 1997

Country	Year	All Goods Imports from world (\$ Million)	As % of All Imports						
			All Manufactures	Manufactures excluding Chemicals	Machines and Transportation Excluding Parts	Parts	Non-Fuel Primaries	Fuels	All Inter-Mediate goods
Bulgaria	1989	4,570	77.2	65.8	34.9	7.5	16.1	5.0	50.5
	1993	2,615	66.9	56.3	22.0	6.9	20.9	10.7	47.8
	1997	3,813	61.1	51.3	15.6	6.2	16.1	20.5	51.2
Czech Rep	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	10,253	84.6	74.0	30.3	13.6	11.6	2.4	64.5
	1997	23,975	79.4	68.6	24.4	14.6	10.2	9.1	65.0
Estonia	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	475	57.0	51.1	22.0	7.6	39.0	1.4	44.4
	1997	3,681	70.6	62.5	22.8	9.8	17.0	11.0	54.7
Hungary	1989	7,689	86.0	70.9	34.8	7.7	11.2	1.4	51.9
	1993	9,894	86.5	74.2	27.9	11.7	10.1	2.4	62.1
	1997	18,354	81.5	71.1	22.4	20.6	8.2	8.9	68.8
Latvia	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	639	68.8	62.4	30.1	6.9	25.7	1.2	37.7
	1997	4,135	56.1	43.3	15.1	5.3	17.7	22.5	45.4
Lithuania	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	909	57.0	48.9	21.9	5.5	28.0	1.1	39.2
	1997	4,938	65.0	53.6	19.9	7.1	16.7	17.0	51.9
Poland	1989	11,272	75.7	64.9	33.1	6.3	19.4	3.2	42.6
	1993	16,947	78.3	65.9	23.9	8.9	14.8	5.2	59.6
	1997	38,267	79.9	67.6	25.0	13.1	10.4	8.3	64.8
Romania	1989	3,305	64.0	51.6	27.2	2.7	19.8	15.2	40.2
	1993	4,413	70.3	62.0	25.0	7.5	22.3	5.4	55.0
	1997	8,679	76.0	67.2	20.1	8.3	10.0	12.6	60.2
Slovakia	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	5,030	77.0	65.1	22.1	10.1	14.4	7.4	63.4
	1997	10,507	71.8	61.6	22.3	13.7	11.8	15.8	61.8
Slovenia	1989	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1993	5,537	78.3	66.3	22.5	10.9	16.3	4.4	62.9
	1997	8,129	78.5	68.2	24.3	11.0	13.8	6.6	63.8
Memo items:									
Turkey	1989	14,037	61.3	49.3	20.6	10.7	16.6	19.9	58.3
	1993	23,507	81.0	69.4	33.0	14.5	13.6	2.5	66.0
	1997	39,163	76.6	63.6	31.6	11.2	13.8	7.2	65.2
Malaysia	1989	19,856	79.2	70.3	34.3	16.3	14.0	4.8	73.1
	1993	39,576	83.7	76.1	36.9	20.1	9.8	3.7	75.8
	1997	72,572	84.7	78.4	41.6	19.9	8.8	2.7	75.3
Mexico	1989	33,105	77.0	68.3	21.3	25.5	16.0	2.7	72.3
	1993	57,415	82.0	73.8	22.9	25.8	12.2	2.1	73.8
	1997	87,941	82.7	73.8	26.4	23.5	10.8	2.8	75.4

Source: Computations based on partners' data from UN COMTRADE Statistics.

Appendix Table 3: Structure of EU-Oriented Exports and Imports of Parts by CEEC, 1993 and 1997

Exports to EU15	Year	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	TUR
All Below Parts	1993	27	511	5	571	4	2	386	31	72	374	259
(in \$ Million)	1997	50	2,045	227	1,606	18	22	1,219	190	500	691	599
In Percent of Total Exports of Parts												
71 Power Generating Equipment	1993	14.7	8.9	2.0	8.1	4.3	0.4	13.7	9.8	6.5	14.8	18.2
	1997	13.3	5.9	3.1	9.7	6.7	3.0	11.3	4.3	3.3	13.5	16.8
72 Machines for Special Industries	1993	12.4	11.7	7.9	10.2	4.5	0.9	10.6	3.0	8.1	5.6	2.5
	1997	12.5	8.9	6.0	6.9	8.0	7.0	8.2	9.7	6.0	3.7	2.5
73 Metal Working Machinery	1993	4.6	4.9	0.4	1.3	0.4	1.4	1.9	5.0	3.4	2.7	0.3
	1997	9.8	3.7	0.2	0.7	0.4	1.0	1.5	8.9	3.7	2.5	0.4
74 Machines for General Industries	1993	16.6	12.9	3.4	10.6	1.4	3.8	14.1	8.6	26.8	9.4	3.9
	1997	22.5	9.3	2.4	6.0	4.0	3.0	9.9	24.8	6.9	6.6	5.2
75 Office Machines & Equipment	1993	2.2	5.5	1.4	1.8	0.6	0.7	0.9	0.8	1.5	1.9	1.3
	1997	1.0	4.4	32.1	14.6	3.6	3.6	1.0	0.5	2.5	0.8	0.6
76 Telecommunication Equipment	1993	13.3	2.3	42.7	32.4	25.9	11.2	5.4	3.4	4.3	2.0	6.5
	1997	7.1	3.3	37.5	13.6	14.0	14.7	10.2	2.3	11.0	1.1	9.8
77 Electrical Machinery	1993	18.0	22.0	2.6	12.8	4.3	15.5	16.4	18.8	8.2	16.7	3.3
	1997	12.9	20.8	11.2	17.5	13.6	22.1	16.0	7.0	10.2	14.0	4.0
78 Road Vehicles	1993	10.0	17.5	16.8	15.6	19.8	26.0	15.9	20.2	16.3	22.4	32.3
	1997	10.9	27.2	2.5	24.1	5.5	4.8	25.9	24.5	46.3	17.9	40.0
79 Other Transport Equipment	1993	2.1	4.4	0.0	1.0	6.0	0.1	5.3	9.7	7.6	1.2	21.9
	1997	0.2	2.3	0.2	1.5	3.6	1.1	0.9	3.2	4.2	0.2	9.3
8 Other Manufacturing	1993	6.1	9.9	22.8	6.2	32.7	40.0	15.9	20.7	17.2	23.3	9.8
	1997	9.8	14.2	4.8	5.2	40.5	39.8	15.1	14.9	5.8	39.7	11.5
Imports from EU-15		BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	TUR
Imports from EU15	1993	121	1,078	17	951	33	42	1,191	198	265	507	2,252
All Below Parts (in million of US dollars)	1997	165	2,955	330	3,136	147	272	4,087	517	1,036	739	3,309
In Percent of Total Imports of Parts												
71 Power Generating Equipment	1993	5.6	3.4	10.6	7.5	5.7	5.5	3.0	6.0	3.5	3.9	6.4
	1997	3.5	5.2	3.7	16.6	4.2	2.5	3.5	4.7	5.9	3.9	8.9
72 Machines for Special Industries	1993	14.4	11.4	11.9	7.9	13.1	7.1	10.4	15.5	23.0	6.1	10.1
	1997	13.3	7.0	3.9	4.1	4.2	5.6	6.4	8.4	5.9	6.5	9.9
73 Metal Working Machinery	1993	2.1	3.0	0.2	1.3	0.1	1.3	1.4	2.9	5.5	1.8	1.6
	1997	1.3	1.9	0.3	0.6	0.7	0.1	1.1	3.4	1.5	2.1	1.9
74 Machines for General Industries	1993	13.5	10.3	13.5	9.2	7.8	9.7	10.3	10.6	9.8	6.9	7.4
	1997	13.7	8.9	4.1	3.8	7.7	6.6	6.4	9.2	5.9	8.8	7.4
75 Office Machines & Equipment	1993	6.1	12.0	7.6	8.4	15.1	9.2	5.7	6.6	7.0	4.1	2.8
	1997	3.9	5.4	7.5	12.9	6.1	3.4	3.1	3.6	3.4	2.8	4.0
76 Telecommunication Equipment	1993	17.9	14.3	22.4	28.2	21.6	16.7	23.1	33.2	18.0	8.7	15.0
	1997	30.2	18.3	47.5	17.3	30.9	34.8	22.0	46.8	20.3	14.2	23.0
77 Electrical Machinery	1993	16.1	24.2	6.5	16.9	10.9	5.0	15.7	12.4	14.5	12.7	11.1
	1997	15.5	23.3	17.9	12.4	14.6	12.2	12.9	14.5	14.6	14.8	11.0
78 Road Vehicles	1993	18.5	16.6	22.3	16.7	22.7	42.2	26.2	8.5	13.8	51.6	42.8
	1997	13.6	24.1	13.2	30.3	29.0	32.9	41.7	6.3	38.4	40.1	30.2
79 Other Transport Equipment	1993	1.4	1.3	0.4	0.7	0.3	1.4	0.9	2.0	2.6	0.8	1.4
	1997	1.3	1.0	0.1	0.7	0.4	0.5	0.5	0.8	1.8	0.3	2.3
8 Other Manufacturing	1993	4.4	3.7	4.6	3.1	2.8	1.9	3.3	2.3	2.4	3.3	1.4
	1997	3.6	4.9	1.8	1.3	2.3	1.4	2.5	2.2	2.3	6.4	1.4

Source: Computations based on partners' data from UN COMTRADE Statistics.

Appendix Table 4: RCA Indices of CEEC EU-Oriented Exports and Imports in 1997

Product SITC Rev. 2	Bulgaria		Czech R.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	X	M	X	M	X	M	X	M	X	M	X	M	X	M	X	M	X	M	X	M
7119 Pts Nes Of App Of Stm Boilers	4.6	3.9	1.7	9.6	13.1	9.5	1.6	3.1	1.2	8.9	N.A.	1.1	13.4	3.8	1.1	2.9	4.4	4.9	0.1	0.5
71319 Pts Nes Of Engr Of Aircraft	0.4	2.0	0.0	0.5	0.0	1.3	0.0	0.7	N.A.	2.8	0.1	1.5	0.1	0.4	0.1	2.5	0.0	0.1	0.1	1.3
71331 Outboard For Marine	0.0	0.7	N.A.	0.1	N.A.	4.4	0.0	0.2	N.A.	1.6	N.A.	0.2	N.A.	0.3	N.A.	0.2	N.A.	0.0	0.0	0.7
71332 Other Than Outboard For Marine	0.0	0.6	0.0	0.1	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.9	0.7	3.0	0.0	3.5	N.A.	3.7	0.0	0.2
7139 Piston Engine Parts Nes	0.2	0.4	0.5	0.6	0.0	0.5	1.2	7.3	0.0	0.6	0.0	0.5	1.1	0.6	0.1	0.3	0.1	0.2	0.7	0.4
7149 Engine & Motor Parts Nes	0.4	0.1	0.2	0.2	0.0	0.1	0.3	0.3	0.1	0.1	0.0	0.1	0.2	0.1	0.0	0.2	0.2	0.6	0.1	0.4
7169 Pts Nes Of Rot Elec Plnt	0.9	0.4	9.1	8.9	6.5	1.7	9.2	6.4	1.9	0.7	0.8	0.1	2.2	0.7	0.8	1.2	3.3	12.7	19.6	2.8
71889 Parts Nes Of Water Turb	7.3	N.A.	3.3	3.6	0.4	0.1	1.0	0.3	N.A.	0.1	0.0	0.1	1.2	9.2	4.5	0.0	0.1	50.8	3.1	2.7
72119 Pts Nes Of Machy Of Cultivating	2.0	0.6	1.5	1.9	4.1	0.8	1.8	1.3	2.3	1.4	2.6	2.2	2.7	1.0	1.1	0.9	0.4	0.8	0.2	1.2
72129 Pts Nes Of Machy Of Harvesting	0.8	3.1	1.5	1.9	0.9	0.3	9.6	2.3	0.7	0.6	0.1	0.5	0.7	1.1	0.2	0.9	1.5	1.0	0.4	0.5
72139 Pts Nes Of Machy Of Dairy	0.0	0.2	0.1	1.3	0.1	1.1	0.0	1.2	0.6	0.2	0.0	1.5	1.1	1.2	N.A.	0.6	0.0	0.9	0.0	0.5
72198 Pts Nes Of Mchy Of Wine Mkg	N.A.	3.2	1.2	0.5	0.1	1.3	0.3	6.7	N.A.	N.A.	N.A.	1.1	2.3	2.7	0.6	3.8	N.A.	1.5	N.A.	0.9
72199 Pts Nes Of Mchy Of Oth Agric	3.1	0.1	1.2	2.6	1.8	0.7	1.4	1.7	0.6	0.6	0.9	0.9	1.1	1.3	0.1	0.3	1.5	2.0	0.3	0.4
7239 Constr Etc Machy Pts Nes	1.0	1.4	1.5	1.0	0.9	1.3	1.9	0.4	0.5	0.2	0.7	2.5	1.0	0.7	1.5	1.1	0.5	0.9	0.9	0.5
72449 Pts Nes Of Machs Of Spinning	0.9	2.7	10.9	6.9	0.0	1.6	0.2	1.5	N.A.	1.6	0.0	1.5	0.8	1.2	0.5	2.0	6.9	8.5	0.2	5.6
72469 Loom,Knt Mch Etc Pts Nes	0.0	1.8	3.9	2.3	0.0	0.2	0.2	0.9	0.0	1.3	0.0	0.8	0.2	0.8	0.4	2.2	0.5	3.9	0.1	1.0
72479 Textile Machinry Pts Nes	0.1	1.5	1.3	4.5	0.3	0.6	1.1	0.8	0.0	0.7	0.0	1.1	0.6	2.5	0.1	1.8	0.7	6.2	2.3	3.4
7259 Pts Nes Of Machs Of Paper Milling	0.0	0.4	1.6	2.3	1.7	0.2	0.1	0.6	0.0	0.4	0.1	0.5	1.8	1.4	0.1	0.5	1.1	1.8	0.3	0.8
72689 Pts Nes Of Bookbind Mchs	0.0	N.A.	1.2	1.1	N.A.	0.3	0.2	0.4	N.A.	1.2	0.0	0.1	0.1	0.8	N.A.	2.4	0.0	1.4	0.1	0.5
7269 Pts Nes Of Mch Of Typset & Prt	0.0	2.2	1.1	0.8	0.1	1.8	0.2	0.8	0.0	0.5	0.0	0.3	0.2	1.2	0.2	0.5	0.5	0.6	0.3	0.6
72719 Pts Nes Of Mchy Of Grain Milling	N.A.	0.7	1.2	0.2	0.3	0.5	0.3	1.1	N.A.	0.6	N.A.	0.7	1.8	0.8	0.3	1.5	N.A.	0.2	N.A.	1.2
72729 Pts Nes Of Mchy Of Food Proc	N.A.	2.4	0.0	4.4	0.0	19.9	0.1	1.6	0.3	6.9	N.A.	0.9	0.1	1.1	N.A.	7.8	N.A.	0.1	0.0	0.1
72819 Pts Nes Of Tools Of Sp Indus	0.9	0.7	3.4	1.5	1.8	2.2	0.6	1.3	0.6	2.9	0.1	1.9	0.8	1.7	1.7	1.9	3.6	1.2	1.9	2.2
72839 Parts Nes of Machinery Of Other Mineral	0.4	2.2	2.0	2.4	0.2	0.2	0.7	1.4	0.6	0.8	0.1	0.7	1.3	1.6	0.6	1.4	0.5	1.9	1.0	1.4
72849 Parts Of Machines of other Industries	0.4	2.6	1.4	1.9	3.2	0.9	0.8	2.9	0.2	0.4	0.0	1.5	0.7	2.4	0.5	1.7	0.5	2.1	0.7	1.5
7369 Pts Nes Of Tools Of Metal	0.9	1.0	4.2	3.0	0.3	0.4	0.7	1.3	0.1	0.4	0.2	0.1	1.0	1.1	2.1	1.7	3.1	3.2	1.3	1.8
73719 Pts Nes Of Mchy Of Foundry Eq	0.5	0.6	0.8	5.0	0.0	0.0	0.2	1.1	0.1	0.0	N.A.	0.0	1.3	5.1	1.9	0.5	11.8	2.1	4.6	5.6
73729 Roll-Mill Pts Nes, Rolls	3.0	0.6	2.8	0.6	0.0	0.0	0.6	0.6	N.A.	0.8	0.0	0.1	0.2	0.5	1.4	3.3	0.1	0.4	2.2	1.2

Appendix Table 4. continued.

74149 Pts Nes Of Refrig Equip	0.0	0.9	1.5	2.5	0.0	1.0	0.3	2.7	0.0	1.5	0.0	2.0	0.2	1.2	0.0	1.6	0.0	3.0	0.3	2.3
7429 Pts Nes Of Pumps Of Liquids	0.1	1.1	1.0	2.7	0.1	0.4	0.5	0.9	0.0	0.8	0.0	0.4	0.5	0.4	0.3	0.3	0.5	0.6	0.6	0.6
7439 Pts Nes Of App Of Filters	0.0	0.9	0.7	1.2	0.1	0.5	0.2	0.6	0.0	0.6	0.0	1.3	0.6	1.2	1.9	1.0	0.1	1.5	0.9	1.3
74419 Pts Nes Of Vehc Of Fork Lift	N.A.	0.1	0.6	0.3	13.2	2.3	0.6	1.4	0.9	3.1	0.1	1.0	1.3	0.5	0.5	0.2	0.1	N.A.	1.3	0.3
7449 Pts Nes Of Machy Of Loading	1.1	1.9	2.2	1.6	0.8	0.6	1.2	0.6	0.2	0.6	0.1	0.4	1.2	0.8	0.7	0.6	1.4	1.0	1.1	0.9
74519 Pts Nes Of Tool Of Power Hand	0.0	1.7	0.2	1.5	0.0	2.1	0.3	1.0	0.0	7.5	0.1	4.5	0.3	2.1	0.1	2.3	0.9	2.1	0.5	1.8
74523 Packing Etc Mchy Pts Nes	1.0	2.0	0.5	1.6	0.2	0.5	0.9	1.5	0.1	1.2	0.0	0.9	0.3	1.9	0.1	2.2	0.8	2.3	0.3	2.8
74999 Mach Parts Nonelec Nes	0.5	2.1	0.7	3.2	0.1	0.7	0.7	2.2	0.0	1.6	0.1	1.9	0.6	2.6	0.9	1.8	0.8	2.9	0.4	1.8
759 Office,Adp Mch Pts,Acces	0.0	0.2	0.5	0.6	4.3	0.6	1.4	1.9	0.1	0.4	0.1	0.3	0.1	0.3	0.0	0.2	0.2	0.4	0.1	0.2
764 Telecom Eqpt,Pts,Acc Nes	0.1	1.2	0.2	1.4	3.1	2.7	0.8	1.8	0.2	1.4	0.1	1.9	0.4	1.5	0.0	1.9	0.6	1.9	0.1	0.7
77129 Pts Nes Of Machy Of El Power	0.5	0.7	3.7	5.5	22.1	3.0	1.6	2.6	0.0	0.2	0.0	0.6	0.7	1.2	0.2	3.1	2.4	3.0	2.3	1.9
772 Switchgear Etc,Parts Nes	0.2	0.9	2.1	2.6	0.5	1.6	1.6	1.9	0.3	1.0	0.0	0.9	0.9	1.3	0.2	0.8	0.5	2.0	0.8	1.0
77579 Pts Nes Of Equip Of Dom El Eq	0.0	0.3	0.3	1.3	0.0	0.3	0.1	2.0	N.A.	0.5	N.A.	0.7	0.1	0.4	0.1	0.2	0.1	1.0	2.6	4.9
77589 Electrhmrc Appl Pts Nes	0.1	0.5	3.9	2.5	0.0	0.7	2.3	1.1	N.A.	1.4	0.0	0.5	0.4	2.2	0.0	0.2	1.2	0.6	9.2	3.7
77689 Electric Compon Pts Nes	0.0	0.2	0.5	0.8	0.0	0.2	0.0	2.4	0.0	0.2	5.1	1.3	1.3	0.8	0.0	0.0	3.9	2.8	0.1	0.3
77819 Elec Accumulator Pts Nes	0.1	5.1	0.9	10.8	0.1	0.2	0.1	0.6	N.A.	0.0	0.0	0.1	0.6	1.7	N.A.	1.5	0.2	0.3	4.8	2.9
77829 Pts Nes Of Lamps Of El, Bulbs	0.3	0.0	0.7	0.9	N.A.	1.1	2.3	2.5	0.1	2.4	N.A.	1.6	0.4	3.8	0.1	1.1	0.1	2.5	0.0	0.6
77889 Elec Parts Of Machy Nes	0.0	1.5	0.1	1.1	0.0	0.4	0.7	0.6	0.1	0.8	N.A.	1.4	0.1	0.6	0.0	0.4	0.0	0.9	0.0	0.6
784 Motor Veh Prts,Acces Nes	0.1	0.3	0.8	1.1	0.1	0.5	0.6	1.9	0.0	0.8	0.0	1.0	0.4	1.7	0.2	0.2	1.1	2.2	0.4	1.3
78539 Parts,Acces Nes Of Cycles	0.0	0.1	1.4	1.5	0.2	0.2	0.3	0.8	0.2	0.0	0.3	3.4	0.8	1.4	0.0	0.1	1.2	0.5	0.8	0.5
78689 Pts Nes Of Trailers Etc	0.4	0.4	1.7	1.2	0.8	0.4	4.5	1.5	0.1	1.5	0.0	0.2	2.0	1.0	1.0	0.2	2.3	0.9	1.1	1.1
79199 Parts Nes Of El Locos	0.1	0.3	5.0	2.8	0.1	0.1	3.0	3.1	0.0	0.0	0.0	0.1	0.8	1.3	1.6	1.1	7.8	8.0	0.0	0.4
7929 Aircraft Parts Nes	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
82119 Pts Nes Of Chairs Etc	0.6	0.4	12.0	4.8	1.7	0.3	2.0	0.5	1.9	0.3	0.5	0.2	4.6	1.5	1.1	0.4	1.7	2.4	27.3	3.3
82199 Othr Furn,Furn Parts Nes	0.6	1.4	1.7	1.1	3.8	0.9	1.3	0.7	5.2	0.9	4.5	0.6	3.0	0.9	2.0	0.5	2.4	0.8	4.4	2.0
87429 Pts Nes Of Inst Of Measuring	1.4	0.8	0.6	1.4	0.0	0.4	1.3	2.1	0.0	0.3	0.1	0.4	0.1	0.6	0.1	0.8	0.4	1.2	0.0	0.5
88119 Pts Nes Of Appar Of Camera	N.A.	0.3	1.4	1.3	0.0	0.8	0.0	0.3	N.A.	0.4	0.0	0.5	0.1	0.4	0.0	2.7	0.0	0.5	0.0	0.3
88121 -- For Film Under 16mm	0.1	0.0	0.3	0.7	N.A.	0.3	0.0	1.2	1.8	0.8	0.2	0.3	0.1	0.6	0.0	0.1	0.0	0.1	3.1	0.0
88129 Pts Nes Of Appar Of Cinema	0.4	0.1	0.4	0.5	N.A.	0.4	0.2	1.8	0.1	0.6	0.2	1.2	0.1	2.3	N.A.	1.5	0.0	2.5	0.0	1.0
88411 Optical Elmnts Unmounted	0.1	0.1	0.0	0.1	0.0	0.2	2.6	0.4	N.A.	0.4	0.0	0.2	0.1	0.2	0.0	0.0	N.A.	0.1	0.0	0.2
88529 Clock,Watch Parts Nes	0.0	0.1	8.9	4.3	N.A.	0.7	0.6	1.7	N.A.	0.4	N.A.	0.5	0.6	1.2	N.A.	0.2	N.A.	0.3	0.5	2.7
89949 Parts Nes Of Umbr & Sunshade	0.2	2.3	1.9	8.1	0.2	1.1	0.5	3.3	N.A.	0.1	N.A.	0.2	0.5	3.0	1.2	2.4	0.8	0.4	0.9	1.0
All Above Parts & Components	0.2	0.7	1.1	1.4	1.3	1.0	0.9	1.9	0.2	0.8	0.1	1.0	0.6	1.2	0.2	0.7	0.8	1.7	0.9	0.9

Notes: X stands for RCA indices calculated on exports and M for those calculated on imports.
Source: Computations based on partners' data from UN COMTRADE Statistics.

Appendix Table 5: Shares of Motor Vehicles, Parts and Components in EU Exports and Imports, 1993 and 1998 (in percent)

Share in EU-outside imports	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
781 pass motor veh exc buses	0.001	0.000	0.450	1.661	0.000	0.001	0.018	0.515	0.003	0.001	0.000	0.001	0.814	0.863	0.010	0.005	0.044	1.650	0.400	0.778
782 lorries, spcl mtr veh nes	0.004	0.003	0.619	0.646	0.000	0.008	0.037	0.007	0.000	0.003	0.000	0.006	0.174	1.631	0.005	0.004	0.064	0.007	0.543	0.645
783 road motor vehicles nes	0.004	0.044	0.209	0.580	0.000	0.010	0.183	0.191	N.A.	0.003	0.001	0.008	0.015	0.286	0.004	0.006	N.A.	0.018	0.270	0.115
722 tractors non-road	0.027	0.002	2.328	1.549	0.010	0.004	0.050	0.036	0.007	0.023	0.142	0.015	0.768	1.105	0.144	0.132	0.495	0.163	0.025	0.042
74411 fork lift trucks etc.	0.608	0.158	0.830	0.078	0.026	0.004	0.085	0.016	0.013	0.005	0.001	0.012	0.040	0.036	0.036	0.026	0.268	0.133	0.162	0.046
Components																				
77831 ignition starting equip	0.028	0.005	0.216	0.344	N.A.	0.005	1.292	3.536	N.A.	0.005	0.000	0.000	0.052	0.234	0.009	0.008	0.012	0.018	0.877	1.679
77832 elect vehicle lightng equ	0.008	0.003	0.192	3.926	0.000	0.002	0.229	1.392	N.A.	N.A.	0.008	0.006	0.173	0.903	0.015	0.009	0.023	0.018	1.452	1.099
7132 piston engines	0.001	0.004	0.030	0.177	0.000	0.000	1.653	23.701	0.000	0.000	0.001	0.000	0.012	0.012	0.003	0.003	0.001	0.002	0.044	0.012
71623 generating sets with piston engines	0.081	0.019	0.201	0.040	0.000	0.002	0.008	0.009	0.000	0.002	0.001	0.025	0.135	0.923	0.000	0.105	0.007	0.011	0.009	0.058
Parts																				
7139 piston engines parts	0.012	0.030	0.324	1.116	0.001	0.004	0.105	1.900	0.000	0.002	0.000	0.000	0.801	1.530	0.027	0.053	0.021	0.092	0.606	0.321
784 motor veh prts, acces nes	0.008	0.012	0.261	1.702	0.002	0.013	0.184	0.923	0.001	0.001	0.001	0.002	0.146	0.773	0.011	0.102	0.025	0.552	0.256	0.361
74419 vehicles of 74411	0.364	0.084	0.438	0.931	0.004	2.347	14.645	2.969	N.A.	0.110	0.009	0.000	2.622	1.085	0.342	0.075	0.056	0.009	0.628	3.225
Motor vehicles	0.011	0.006	0.505	1.434	0.001	0.002	0.027	0.406	0.003	0.002	0.003	0.002	0.707	0.940	0.013	0.008	0.057	1.278	0.399	0.699
Parts and components	0.009	0.012	0.256	1.711	0.001	0.013	0.245	1.063	0.001	0.002	0.001	0.002	0.145	0.753	0.012	0.094	0.024	0.501	0.328	0.453
Share in EU external exports	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
781 pass motor veh exc buses	0.132	0.092	0.500	0.503	0.059	0.102	0.706	0.609	0.099	0.077	0.094	0.113	1.041	0.975	0.095	0.117	0.083	0.168	0.547	0.452
782 lorries, spcl mtr veh nes	0.279	0.228	1.208	0.970	0.063	0.275	1.792	1.328	0.110	0.192	0.120	0.257	2.560	1.856	0.356	0.608	0.125	0.332	0.681	0.618
783 road motor vehicles nes	0.796	0.507	1.737	2.284	0.103	0.442	0.849	1.412	0.223	0.586	0.278	0.726	2.445	2.546	1.773	1.663	0.246	0.661	0.607	0.520
722 tractors non-road	0.074	0.146	0.688	0.318	0.010	0.269	0.587	0.962	0.303	0.428	0.136	0.211	0.205	0.492	0.053	0.326	0.092	0.131	0.516	0.433
74411 fork lift trucks etc	0.076	0.033	1.150	1.559	0.080	0.208	1.217	1.021	0.103	0.231	0.080	0.158	1.232	2.581	0.178	0.334	0.174	0.250	0.221	0.530
Components																				
77831 ignition, starting equip	0.031	0.035	0.212	2.101	0.002	0.054	0.420	1.793	0.006	0.032	0.006	0.072	0.691	0.912	0.026	0.155	0.017	0.710	0.136	0.652
77832 elect vehicle lghtng equ	0.043	0.029	0.252	1.329	0.004	0.059	0.349	1.053	0.024	0.044	0.026	0.061	1.057	1.017	0.013	0.073	0.036	0.794	0.274	0.859
7132 piston engines	0.008	0.005	0.027	1.749	0.000	0.003	0.226	0.146	0.002	0.003	0.001	0.003	1.010	2.053	0.058	0.066	0.003	1.770	0.927	1.894
71623 generating sets with piston engines	0.105	0.177	1.118	1.120	0.132	0.257	0.266	0.554	0.018	0.348	0.003	0.476	1.833	4.278	0.303	0.788	0.150	0.364	0.210	0.494
Parts																				
7139 piston engines parts	0.076	0.118	0.483	0.964	0.018	0.111	1.160	11.705	0.043	0.081	0.041	0.143	0.599	1.410	0.130	0.123	0.044	0.247	0.373	0.195
784 motor veh prts, acces nes	0.076	0.050	0.527	1.932	0.014	0.079	0.491	1.184	0.027	0.046	0.048	0.070	1.086	3.149	0.059	0.086	0.119	1.905	0.920	0.885
74419 Vehicles of 74411	0.927	0.052	0.160	0.381	0.017	0.762	1.842	0.469	N.A.	0.385	0.029	0.132	1.585	1.597	0.023	0.205	0.011	0.000	0.195	0.502
Motor vehicles	0.171	0.131	0.637	0.671	0.060	0.148	0.833	0.760	0.109	0.130	0.105	0.166	1.241	1.189	0.186	0.269	0.096	0.216	0.557	0.478
Parts and components	0.073	0.050	0.502	1.898	0.014	0.079	0.478	1.202	0.025	0.049	0.044	0.075	1.071	2.927	0.058	0.097	0.109	1.761	0.834	0.867

Appendix Table 6: RCA Indices for Automotive Network, 1998

Exports	BULGARIA		CZECH REP		ESTONIA		HUNGARY		LATVIA		LITHUANIA		POLAND		ROMANIA		SLOVAKIA		SLOVENIA	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
781 pass motor veh exc buses	0.01	0.00	0.51	0.98	0.01	0.00	0.03	0.30	0.14	0.02	0.01	0.01	0.72	0.52	0.03	0.01	0.19	2.57	0.66	1.24
782 lorries,spcl mtr veh nes	0.03	0.01	0.70	0.38	0.01	0.05	0.06	0.00	0.01	0.04	0.00	0.05	0.15	0.99	0.02	0.01	0.29	0.01	0.90	1.03
783 road motor vehicles nes	0.04	0.22	0.24	0.34	0.01	0.07	0.27	0.11	N.A.	0.03	0.05	0.06	0.01	0.17	0.01	0.01	N.A.	0.03	0.45	0.18
722 tractors non-road	0.23	0.01	2.64	0.92	0.43	0.03	0.07	0.02	0.27	0.31	4.75	0.12	0.68	0.67	0.44	0.21	2.21	0.25	0.04	0.07
74411 fork lift trucks etc	5.24	0.79	0.94	0.05	1.15	0.03	0.13	0.01	0.55	0.07	0.03	0.10	0.04	0.02	0.11	0.04	1.20	0.21	0.27	0.07
Components																				
77831 ignition, starting equip	0.25	0.03	0.24	0.20	N.A.	0.04	1.93	2.08	N.A.	0.07	0.00	0.00	0.05	0.14	0.03	0.01	0.05	0.03	1.45	2.68
77832 elect vehicle lighting equ	0.07	0.02	0.22	2.32	0.00	0.02	0.34	0.82	N.A.	N.A.	0.27	0.05	0.15	0.55	0.05	0.01	0.10	0.03	2.41	1.75
7132 piston engines	0.01	0.02	0.03	0.10	0.00	0.00	2.47	13.94	0.00	0.00	0.04	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.07	0.02
71623 generating sets with piston engines	0.70	0.09	0.23	0.02	0.02	0.01	0.01	0.01	0.02	0.03	0.03	0.21	0.12	0.56	0.00	0.17	0.03	0.02	0.01	0.09
Parts																				
784 motor veh parts ,access nes	0.07	0.06	0.30	1.01	0.07	0.09	0.27	0.54	0.05	0.02	0.04	0.01	0.13	0.47	0.03	0.16	0.11	0.86	0.42	0.58
7139 piston engines parts	0.10	0.15	0.37	0.66	0.02	0.03	0.16	1.12	0.00	0.02	0.00	0.00	0.71	0.93	0.08	0.09	0.09	0.14	1.00	0.51
<i>Motor Vehicles</i>	0.10	0.03	0.57	0.85	0.04	0.02	0.04	0.24	0.13	0.03	0.11	0.02	0.63	0.57	0.04	0.01	0.25	1.99	0.66	1.11
<i>Parts and Components</i>	0.08	0.06	0.29	1.01	0.06	0.09	0.37	0.63	0.04	0.02	0.05	0.02	0.13	0.46	0.04	0.15	0.11	0.78	0.54	0.72
Imports																				
Components																				
77831 ignition, starting equip	0.17	0.17	0.19	1.30	0.05	0.22	0.43	1.17	0.12	0.22	0.10	0.36	0.46	0.36	0.07	0.25	0.07	1.24	0.26	1.05
77832 elect vehicle lghtng equ	0.23	0.14	0.23	0.83	0.13	0.24	0.35	0.69	0.46	0.30	0.44	0.31	0.71	0.40	0.04	0.12	0.15	1.38	0.52	1.38
7132 piston engines	0.04	0.02	0.02	1.09	0.01	0.01	0.23	0.09	0.03	0.02	0.02	0.01	0.68	0.81	0.17	0.11	0.01	3.08	1.77	3.05
71623 gen sets with pistn engn	0.55	0.85	1.03	0.70	4.11	1.04	0.27	0.36	0.33	2.38	0.05	2.38	1.23	1.69	0.87	1.27	0.63	0.63	0.40	0.80
Parts																				
784 motor veh parts ,access nes	0.40	0.24	0.49	1.20	0.42	0.32	0.50	0.77	0.50	0.32	0.80	0.35	0.73	1.25	0.17	0.14	0.50	3.32	1.76	1.43
7139 piston engines parts	0.40	0.57	0.45	0.60	0.58	0.45	1.18	7.63	0.81	0.55	0.68	0.72	0.40	0.56	0.37	0.20	0.18	0.43	0.71	0.31
<i>Motor Vehicles</i>	0.90	0.63	0.59	0.42	1.89	0.60	0.84	0.50	2.04	0.89	1.75	0.83	0.83	0.47	0.53	0.44	0.40	0.38	1.06	0.77
<i>Parts and Components</i>	0.38	0.24	0.46	1.18	0.43	0.32	0.48	0.78	0.48	0.34	0.74	0.37	0.72	1.16	0.16	0.16	0.46	3.07	1.59	1.40

Source: Computations based on EU data from UN COMTRADE Statistics.

Appendix Table 7: Share of Office Machinery Equipment and Parts in EU Imports and Exports, 1993 and 1998 (in percent)

	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Share in EU-external imports																				
7511 typewriters,cheque-wrtrs	2.114	0.434	15.664	3.554	N.A.	N.A.	0.006	0.000	N.A.	0.008	N.A.	0.004	0.027	0.355	N.A.	0.008	N.A.	0.207	0.062	1.083
75181 duplicat mch,hecto,stncl	N.A.	N.A.	0.483	0.002	N.A.	N.A.	0.712	0.013	N.A.	N.A.	N.A.	N.A.	0.090	0.022	N.A.	N.A.	0.041	0.003	N.A.	N.A.
75188 othr office machines nes	0.016	0.013	0.077	0.566	0.000	0.024	0.245	0.383	N.A.	0.002	N.A.	0.002	0.072	0.039	0.006	0.001	0.000	0.055	0.022	0.003
7512 calculatng,acctg,etc mch	N.A.	N.A.	0.096	0.059	N.A.	0.002	0.037	0.029	N.A.	N.A.	N.A.	0.013	0.164	0.244	N.A.	0.001	N.A.	0.037	0.015	0.028
Parts																				
75911 typewrtr parts,acces nes	N.A.	0.016	2.780	0.775	N.A.	0.007	0.020	0.198	N.A.	0.012	N.A.	0.005	0.184	0.210	0.002	0.094	N.A.	0.056	0.204	0.011
75915 oth off mch pts,acc nes	0.003	0.004	0.036	0.255	0.000	0.030	0.288	0.309	N.A.	0.003	0.001	0.000	0.032	0.168	0.013	0.028	N.A.	0.035	1.878	0.530
75919 copy mach parts,acces nes	0.015	0.005	0.031	0.722	N.A.	N.A.	0.031	0.186	N.A.	0.007	N.A.	0.001	0.062	0.083	0.001	0.001	0.005	0.344	0.002	0.061
7599 acctg,etc,adp mch pts,ac	0.005	0.005	0.305	0.672	0.001	0.409	0.104	2.748	0.000	0.008	0.000	0.002	0.032	0.100	0.002	0.037	0.012	0.227	0.023	0.027
Office Machinery Equipment	0.293	0.019	2.171	0.476	0.000	0.017	0.169	0.262	N.A.	0.002	N.A.	0.005	0.089	0.098	0.004	0.001	0.001	0.051	0.025	0.036
Parts	0.006	0.005	0.278	0.661	0.001	0.363	0.100	2.456	0.000	0.008	0.000	0.002	0.036	0.102	0.002	0.034	0.011	0.228	0.071	0.048
Share in EU-external exports																				
7511 typewriters,cheque-wrtrs	0.541	0.588	5.426	2.676	0.036	0.091	1.654	0.848	0.158	0.204	0.141	0.373	8.308	4.584	0.858	1.104	0.966	0.443	0.494	0.316
75181 duplicat mch,hecto,stncl	0.071	0.074	1.148	0.329	0.142	0.051	0.935	0.543	N.A.	0.232	0.142	0.167	0.680	0.427	0.482	0.125	0.227	N.A.	0.595	0.232
75188 othr office machines nes	0.443	0.166	2.673	0.896	0.027	0.290	1.878	1.890	0.062	0.363	0.050	0.461	1.111	3.498	0.223	0.433	1.135	0.372	0.519	0.520
7512 calculatng,acctg,etc mch	0.101	0.047	1.899	2.262	0.050	0.200	3.773	2.156	0.077	0.161	0.070	0.136	0.809	6.227	0.249	0.366	0.431	0.531	0.559	0.639
Parts																				
75911 typewrtr parts,acces nes	0.547	0.716	30.304	5.479	0.005	0.841	1.508	1.889	0.011	0.119	0.011	0.472	2.530	4.711	0.642	0.914	0.155	0.262	4.430	0.685
75915 oth off mch pts,acc nes	0.011	0.069	0.790	0.891	0.007	0.078	3.475	0.404	0.001	0.032	0.043	0.062	1.133	0.781	0.134	0.067	0.132	0.096	0.111	0.165
75919 copy mach parts,acces nes	0.139	0.056	0.677	2.087	0.026	0.132	0.610	0.434	0.193	0.087	0.048	0.057	0.660	0.709	0.222	0.189	0.189	0.606	0.121	0.078
7599 acctg,etc,adp mch pts,ac	0.056	0.055	1.053	1.164	0.010	0.147	0.630	4.422	0.030	0.112	0.033	0.070	0.574	1.050	0.101	0.141	0.165	0.346	0.169	0.163
Office Machinery Equipment	0.376	0.147	2.821	1.278	0.034	0.259	2.271	1.908	0.077	0.306	0.066	0.373	1.908	4.165	0.307	0.431	0.951	0.409	0.526	0.540
Parts	0.065	0.058	1.152	1.204	0.012	0.143	0.718	3.915	0.045	0.105	0.035	0.070	0.609	1.020	0.117	0.140	0.167	0.342	0.184	0.160

Source: Computations based on EU data from UN COMTRADE Statistics.

Appendix Table 8: RCA Indices of Office Machinery Equipment and Parts, 1993 and 1998

Commodity & Parts Exports	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
7511 typewriters,cheque-wrtrs	18.22	2.17	17.79	2.10	N.A.	N.A.	0.01	0.00	N.A.	0.10	N.A.	0.03	0.02	0.21	N.A.	0.01	N.A.	0.32	0.10	1.73
75181 duplicat mch,hecto,stncl	N.A.	N.A.	0.55	0.00	N.A.	N.A.	1.06	0.01	N.A.	N.A.	N.A.	N.A.	0.08	0.01	N.A.	N.A.	0.18	0.00	N.A.	N.A.
75188 othr office machines nes	0.14	0.07	0.09	0.34	0.01	0.17	0.37	0.23	N.A.	0.03	N.A.	0.02	0.06	0.02	0.02	0.00	0.00	0.09	0.04	0.01
7512 calculatng,acctg,etc mch	N.A.	N.A.	0.11	0.03	N.A.	0.01	0.05	0.02	N.A.	N.A.	N.A.	0.11	0.15	0.15	N.A.	0.00	N.A.	0.06	0.02	0.05
Parts																				
75911 typewrtr parts,acces nes	N.A.	0.08	3.16	0.46	N.A.	0.05	0.03	0.12	N.A.	0.16	N.A.	0.04	0.16	0.13	0.01	0.15	N.A.	0.09	0.34	0.02
75915 oth off mch pts,acc nes	0.03	0.02	0.04	0.15	0.02	0.21	0.43	0.18	N.A.	0.04	0.02	0.00	0.03	0.10	0.04	0.04	N.A.	0.05	3.11	0.85
75919 copy mach parts,acces nes	0.13	0.02	0.03	0.43	N.A.	N.A.	0.05	0.11	N.A.	0.10	N.A.	0.01	0.05	0.05	0.00	0.00	0.02	0.54	0.00	0.10
7599 acctg,etc,adp mch pts,ac	0.04	0.02	0.35	0.40	0.04	2.85	0.15	1.62	0.01	0.11	0.00	0.02	0.03	0.06	0.01	0.06	0.05	0.35	0.04	0.04
Office Machinery Equipment	2.52	0.10	2.47	0.28	0.01	0.12	0.25	0.15	N.A.	0.02	N.A.	0.04	0.08	0.06	0.01	0.00	0.00	0.08	0.04	0.06
Office Machinery Parts	0.05	0.02	0.32	0.39	0.03	2.53	0.15	1.44	0.01	0.11	0.00	0.02	0.03	0.06	0.01	0.05	0.05	0.35	0.12	0.08
Commodity & Parts Imports	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
7511 typewriters,cheque-wrtrs	2.85	2.84	5.00	1.66	1.12	0.37	1.68	0.55	2.98	1.39	2.35	1.87	5.57	1.81	2.45	1.78	4.07	0.77	0.94	0.51
75181 duplicat mch,hecto,stncl	0.37	0.36	1.06	0.20	4.42	0.21	0.95	0.35	N.A.	1.59	2.37	0.84	0.46	0.17	1.38	0.20	0.96	N.A.	1.14	0.37
75188 othr office machines nes	2.34	0.80	2.46	0.56	0.85	1.17	1.90	1.23	1.17	2.48	0.84	2.31	0.75	1.38	0.64	0.70	4.79	0.65	0.99	0.84
7512 calculatng,acctg,etc mch	0.53	0.23	1.75	1.41	2.56	0.81	3.83	1.41	1.45	1.10	1.18	0.68	0.54	2.46	0.71	0.59	1.82	0.92	1.07	1.03
Parts																				
75911 typewrtr parts,acces nes	2.89	3.45	27.90	3.40	0.17	3.40	1.53	1.23	0.20	0.82	0.18	2.37	1.70	1.86	1.83	1.48	0.65	0.46	8.46	1.10
75915 oth off mch pts,acc nes	0.06	0.33	0.73	0.55	0.22	0.32	3.52	0.26	0.02	0.22	0.72	0.31	0.76	0.31	0.38	0.11	0.56	0.17	0.21	0.27
75919 copy mach parts,acces nes	0.73	0.27	0.62	1.30	0.82	0.53	0.62	0.28	3.62	0.60	0.81	0.28	0.44	0.28	0.63	0.30	0.80	1.06	0.23	0.13
7599 acctg,etc,adp mch pts,ac	0.30	0.27	0.97	0.72	0.32	0.59	0.64	2.88	0.56	0.77	0.55	0.35	0.39	0.42	0.29	0.23	0.70	0.60	0.32	0.26
Office Machinery Equipment	1.98	0.71	2.60	0.79	1.06	1.05	2.30	1.24	1.44	2.10	1.11	1.87	1.28	1.65	0.88	0.70	4.01	0.71	1.00	0.87
Office Machinery Parts	0.34	0.28	1.06	0.75	0.37	0.58	0.73	2.55	0.84	0.72	0.58	0.35	0.41	0.40	0.33	0.23	0.70	0.60	0.35	0.26

Source: Computations based on EU data from UN COMTRADE Statistics.

Appendix Table 9: Shares of Telecommunication and 'Audio/Visual Network' in EU Imports and Exports, 1993 and 1998 (in percent)

Shares in EU Imports	BULGARIA		CZECH REP		ESTONIA		HUNGARY		LATVIA		LITHUANIA		POLAND		ROMANIA		SLOVAKIA		SLOVENIA	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
761 television receivers	0.00	0.00	0.01	0.77	0.00	0.02	0.10	6.47	0.00	0.00	0.00	0.11	0.00	8.96	0.13	0.00	0.04	0.03	0.30	0.36
762 radio broadcast receivers	0.00	0.08	0.02	0.02	0.00	0.00	0.15	7.34	N.A.	N.A.	N.A.	0.00	0.09	0.14	0.00	0.00	0.00	0.00	0.00	0.00
763 sound recorders, phonographs	0.00	0.32	0.14	0.26	N.A.	0.00	1.05	30.20	0.00	0.00	0.00	0.00	0.04	0.06	0.00	0.01	0.00	0.00	0.00	0.01
7643 tv, radio transmitters etc	N.A.	0.01	0.02	0.08	0.00	1.66	0.00	0.04	N.A.	0.00	0.00	0.01	0.00	0.11	0.00	0.04	0.00	0.01	0.02	0.02
7648 telecomm equipment nes	0.30	0.02	0.08	0.95	N.A.	0.03	0.05	0.35	0.00	0.02	0.00	0.03	0.06	0.06	0.00	0.01	0.00	0.07	0.01	0.07
Components																				
7641 line telephone, etc equip	0.00	0.02	0.11	0.09	N.A.	0.01	0.16	0.09	0.00	0.00	0.00	0.00	0.08	0.31	0.00	0.02	0.01	0.05	0.05	0.05
7642 microph, loudspkr, amplifr	0.04	0.05	0.51	1.46	0.00	0.73	0.53	2.42	0.12	0.15	0.00	0.00	0.81	1.49	0.03	0.00	0.03	0.07	0.03	0.02
7761 tv picture tubes	N.A.	0.00	0.96	3.13	N.A.	N.A.	0.00	0.08	N.A.	N.A.	0.03	1.94	5.18	12.71	N.A.	N.A.	0.01	0.01	N.A.	0.01
7762 other electronic tubes etc	0.02	N.A.	0.22	0.03	N.A.	N.A.	0.34	0.76	0.00	N.A.	0.02	0.10	5.14	0.87	0.00	0.00	0.00	0.03	0.04	0.02
7763 diodes, transistors, etc	0.00	0.08	0.04	2.35	N.A.	0.01	0.53	2.15	0.00	0.00	0.00	0.10	0.02	0.11	0.01	0.01	0.10	0.30	0.40	0.22
7764 electronic microcircuits	0.01	0.02	0.02	0.22	0.00	0.01	0.04	0.11	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.01
Parts																				
7649 parts nes of equipment of 76	0.02	0.02	0.13	0.36	0.05	0.44	4.06	3.38	0.00	0.01	0.00	0.02	0.30	0.80	0.02	0.16	0.06	0.62	0.14	0.06
7768 electronic comp parts, crystals	0.01	0.04	0.53	0.39	0.00	0.00	0.03	0.27	N.A.	0.00	0.00	0.56	0.71	2.31	0.00	0.00	0.01	2.88	0.07	0.02
Final products	0.02	0.04	0.09	0.31	0.00	0.61	0.31	4.45	0.01	0.01	0.00	0.03	0.08	2.05	0.05	0.02	0.02	0.03	0.11	0.10
Parts/Components	0.01	0.02	0.16	0.56	0.02	0.18	1.49	1.54	0.00	0.01	0.00	0.14	0.59	1.08	0.01	0.07	0.03	0.37	0.08	0.04
Shares in EU Exports	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Components																				
7641 line telephone, etc equip	0.36	0.25	2.85	1.25	0.01	0.27	2.53	1.02	0.03	0.26	0.05	0.35	7.20	2.07	0.91	0.62	1.30	0.40	0.40	0.40
7642 microph, loudspkr, amplifr	0.12	0.15	0.64	1.09	0.03	0.41	0.44	1.34	0.04	0.12	0.03	0.13	0.73	1.63	0.06	0.15	0.07	0.30	0.23	0.44
7761 tv picture tubes	0.04	0.02	0.32	1.53	0.00	0.00	0.69	5.93	N.A.	0.00	0.00	0.05	5.06	15.41	0.32	0.27	0.44	1.69	0.49	0.85
7762 other electronic tubes etc	0.42	0.14	0.22	0.41	0.01	0.02	13.59	3.55	0.00	0.03	0.01	0.18	0.99	1.22	0.10	0.29	0.03	0.10	0.34	0.38
7763 diodes, transistors, etc	0.08	0.06	0.45	1.66	0.00	1.01	1.47	3.64	0.00	0.02	0.02	0.05	0.93	0.91	0.03	0.11	0.14	0.57	0.25	0.32
7764 electronic microcircuits	0.03	0.03	0.24	0.40	0.00	0.88	0.47	0.85	0.01	0.01	0.00	0.05	0.40	0.65	0.02	0.12	0.08	0.15	0.08	0.11
Parts																				
7649 parts nes of equipment of 76	0.15	0.42	1.39	1.53	0.04	1.10	3.59	5.40	0.04	0.13	0.03	0.18	1.86	3.01	0.87	1.30	0.36	1.00	0.46	0.51
7768 electronic comp parts, crystals	0.11	0.06	1.03	1.15	0.00	0.90	0.80	8.27	0.00	0.02	0.11	0.28	2.72	3.74	0.13	0.05	0.24	1.31	0.09	0.17
Final products	0.14	0.15	0.90	1.06	0.02	0.30	0.84	1.02	0.05	0.16	0.05	0.22	1.76	2.50	0.21	0.65	0.25	0.47	0.24	0.29
Parts/Components	0.08	0.16	0.66	0.94	0.01	0.91	1.81	3.03	0.02	0.05	0.02	0.10	1.29	2.25	0.33	0.52	0.20	0.57	0.25	0.30

Source: Computations based on EU data from UN COMTRADE Statistics.

Appendix Table 10: RCA Indices for the Telecommunication and 'Audio/Visual Network', 1993 and 1998

Exports	BULGARIA		CZECH REP		ESTONIA		HUNGARY		LATVIA		LITHUANIA		POLAND		ROMANIA		SLOVAKIA		SLOVENIA	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
761 television receivers	0.0	0.00	0.0	0.46	0.0	0.12	0.2	3.81	0.0	0.00	0.2	0.93	0.0	5.42	0.4	0.00	0.2	0.05	0.5	0.58
762 radio broadcast receivers	0.0	0.39	0.0	0.01	0.0	0.02	0.2	4.31	N.A.	N.A.	N.A.	0.00	0.1	0.09	0.0	0.00	0.0	0.00	0.0	0.01
763 sound records, phonograph	0.0	1.61	0.2	0.15	N.A.	0.01	1.6	17.76	0.0	0.03	0.0	0.00	0.0	0.04	0.0	0.01	0.0	0.00	0.0	0.02
7643 tv, radio transmitters etc	N.A.	0.06	0.0	0.05	0.0	11.56	0.0	0.02	N.A.	0.03	0.0	0.05	0.0	0.07	0.0	0.06	0.0	0.02	0.0	0.04
7648 telecommunication equipment nes	2.6	0.11	0.1	0.56	N.A.	0.24	0.1	0.21	0.1	0.30	0.1	0.25	0.1	0.04	0.0	0.01	0.0	0.12		0.12
Components																				
7641 line telephone, etc equip	0.0	0.09	0.1	0.05	N.A.	0.08	0.2	0.05	0.1	0.03	0.0	0.04	0.1	0.19	0.0	0.04	0.0	0.08	0.1	0.07
7642 microphone, loudspeaker, amplifier	0.3	0.23	0.6	0.86	0.0	5.11	0.8	1.42	5.2	2.04	0.2	0.04	0.7	0.90	0.1	0.01	0.1	0.10	0.0	0.03
7761 tv picture tubes	N.A.	0.00	1.1	1.85	N.A.	N.A.	0.0	0.05	N.A.	N.A.	1.0	16.36	4.6	7.69	N.A.	N.A.	0.1	0.02	N.A.	0.02
7762 other electronic tubes etc	0.2	N.A.	0.3	0.02	N.A.	N.A.	0.5	0.45	0.1	N.A.	0.7	0.85	4.6	0.53	0.0	0.00	0.0	0.04	0.1	0.03
7763 diodes, transistors, etc	0.0	0.38	0.0	1.39	N.A.	0.06	0.8	1.26	0.0	0.01	0.0	0.85	0.0	0.07	0.0	0.02	0.4	0.47	0.7	0.34
7764 electronic microcircuits	0.1	0.08	0.0	0.13	0.0	0.07	0.1	0.07	0.0	0.08	0.0	0.03	0.0	0.02	0.0	0.00	0.0	0.00	0.0	0.01
Parts																				
7649 parts nes of equipment of 76	0.2	0.11	0.1	0.22	2.2	3.07	6.1	1.99	0.0	0.11	0.0	0.20	0.3	0.49	0.1	0.26	0.3	0.96	0.2	0.10
7768 electronic component parts, crystals	0.1	0.21	0.6	0.23	0.0	0.01	0.0	0.16	N.A.	0.02	0.0	4.72	0.6	1.40	0.0	0.01	0.0	4.50	0.1	0.04
Final products	0.2	0.21	0.1	0.18	0.0	4.27	0.5	2.62	0.3	0.10	0.1	0.23	0.1	1.24	0.1	0.03	0.1	0.04	0.2	0.15
Parts/Components	0.1	0.11	0.2	0.33	0.8	1.25	2.2	0.91	0.0	0.08	0.1	1.16	0.5	0.65	0.0	0.10	0.1	0.58	0.1	0.07
Imports																				
Components																				
7641 line telephone, etc equip	1.9	1.20	2.6	0.77	0.3	1.10	2.6	0.66	0.6	1.80	0.8	1.74	4.8	0.82	2.6	1.00	5.5	0.71	0.8	0.64
7642 microphone, loudspeaker, amplifier	0.6	0.71	0.6	0.67	1.0	1.65	0.4	0.87	0.8	0.81	0.6	0.67	0.5	0.64	0.2	0.25	0.3	0.52	0.4	0.71
7761 tv picture tubes	0.2	0.08	0.3	0.95	0.0	0.00	0.7	3.87	N.A.	0.00	0.1	0.25	3.4	6.10	0.9	0.44	1.9	2.95	0.9	1.37
7762 other electronic tubes etc	2.2	0.66	0.2	0.26	0.2	0.08	13.8	2.32	0.0	0.23	0.1	0.91	0.7	0.48	0.3	0.47	0.1	0.17	0.6	0.61
7763 diodes, transistors, etc	0.4	0.29	0.4	1.03	0.1	4.10	1.5	2.37	0.0	0.15	0.4	0.23	0.6	0.36	0.1	0.17	0.6	0.99	0.5	0.52
7764 electronic microcircuits	0.1	0.16	0.2	0.25	0.1	3.55	0.5	0.56	0.1	0.09	0.1	0.23	0.3	0.26	0.1	0.19	0.3	0.26	0.2	0.18
Parts																				
7649 parts nes of equipment of 76	0.8	2.01	1.3	0.95	1.1	4.45	3.6	3.52	0.7	0.91	0.5	0.88	1.3	1.19	2.5	2.11	1.5	1.74	0.9	0.83
7768 electronic component parts, crystals	0.6	0.31	0.9	0.71	0.0	3.63	0.8	5.39	0.0	0.16	1.8	1.43	1.8	1.48	0.4	0.09	1.0	2.28	0.2	0.27
Final products	0.8	0.74	0.8	0.66	0.6	1.20	0.9	0.66	1.0	1.13	0.8	1.13	1.2	0.99	0.6	1.05	1.1	0.81	0.5	0.46
Parts/Components	0.4	0.79	0.6	0.58	0.5	3.69	1.8	1.98	0.3	0.37	0.3	0.49	0.9	0.89	0.9	0.85	0.8	0.99	0.5	0.48

Source: Computations based on EU data from UN COMTRADE Statistics.

Appendix Table 11: Share of 'Furniture Network' Products and Parts in EU-External Imports and Exports, 1993 and 1998 (in percent)

	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Share in EU imports																				
82111 chairs and other seats	0.24	0.36	2.28	2.20	0.11	0.74	1.47	1.83	0.20	0.23	0.03	0.29	8.32	19.63	3.22	2.47	0.84	0.80	1.55	1.34
82121 medical furniture	0.00	0.00	0.39	2.24	0.00	0.02	0.16	0.83	0.00	0.00	0.00	0.03	0.44	1.23	0.00	0.03	0.05	0.12	0.05	0.46
82191 metal furniture nes	0.04	0.03	3.13	2.28	0.01	0.07	1.02	0.79	0.03	0.02	0.02	0.02	1.11	2.41	0.67	0.65	1.23	1.49	0.43	0.43
82192 wood furniture nes	0.20	0.25	1.29	1.96	0.14	1.12	0.97	0.84	0.09	0.50	0.21	0.45	6.84	10.15	4.84	4.80	0.41	0.89	1.32	1.36
Parts and components																				
82119 pts nes of chairs etc	0.04	0.14	3.63	18.97	0.02	0.20	1.68	5.38	0.02	0.07	0.00	0.04	3.85	8.23	0.35	0.57	0.27	1.11	5.87	15.73
82122 mattresses etc	0.02	0.24	2.39	2.91	0.30	2.06	2.01	3.11	0.03	0.03	0.00	0.21	3.00	5.82	0.82	0.71	0.16	0.36	1.13	1.37
82199 other furniture, parts nes	0.05	0.14	1.00	2.36	0.07	0.60	0.82	1.56	0.07	0.50	0.04	0.55	1.81	4.87	0.22	1.54	0.73	1.04	2.52	2.47
Final products	0.19	0.25	1.79	2.09	0.11	0.81	1.10	1.15	0.12	0.33	0.12	0.32	6.34	11.71	3.55	3.28	0.63	0.90	1.23	1.19
Parts and components	0.04	0.16	2.10	9.19	0.10	0.69	1.33	3.38	0.05	0.24	0.02	0.29	2.69	6.40	0.39	1.00	0.47	0.95	3.25	7.65
Share in EU exports																				
82111 chairs and other seats	0.09	0.05	0.68	0.80	0.02	0.20	0.70	0.56	0.06	0.10	0.05	0.07	0.60	0.79	0.05	0.09	0.15	0.23	0.15	0.51
82121 medical furniture	0.66	0.32	2.34	1.32	0.03	0.39	1.64	0.97	0.15	0.31	0.15	0.40	2.32	2.38	0.44	0.59	0.38	0.36	0.77	0.77
82191 metal furniture nes	0.27	0.17	1.39	1.63	0.03	0.32	1.35	1.29	0.08	0.27	0.08	0.18	1.15	2.93	0.13	0.54	0.21	0.30	0.34	0.50
82192 wood furniture nes	0.21	0.22	0.89	0.83	0.03	0.28	0.93	0.98	0.11	0.24	0.11	0.21	0.82	1.43	0.12	0.31	0.16	0.30	0.20	1.17
Parts and components																				
82119 pts nes of chairs etc	0.04	0.08	1.27	6.99	0.01	0.06	0.65	2.95	0.01	0.02	0.00	0.09	1.37	4.49	0.02	0.20	0.38	2.55	1.27	1.89
82122 mattresses etc	0.01	0.05	0.92	0.91	0.01	0.34	0.34	0.31	0.01	0.12	0.01	0.20	0.49	0.55	0.02	0.08	0.03	0.29	0.33	0.66
82199 other furniture, parts nes	0.25	0.26	1.11	1.59	0.04	0.25	1.09	1.25	0.05	0.18	0.04	0.16	1.36	2.42	0.19	0.29	0.15	0.37	0.34	0.84
Final products	0.20	0.16	0.93	0.94	0.03	0.26	0.93	0.87	0.09	0.20	0.09	0.17	0.84	1.44	0.11	0.28	0.17	0.28	0.22	0.85
Parts and components	0.13	0.15	1.10	3.21	0.02	0.21	0.78	1.61	0.03	0.11	0.02	0.15	1.13	2.70	0.11	0.22	0.18	1.07	0.57	1.15

Source: Computations based on EU data from UN COMTRADE Statistics.

Appendix Table 12: RCA Indices of Products, Parts and Components of the EU-Based Furniture Network, 1993 and 1998

Exports	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
82111 chairs and other seats	2.06	1.82	2.59	1.30	4.99	5.14	2.19	1.07	8.47	3.09	1.17	2.41	7.36	11.88	9.80	3.95	3.76	1.25	2.57	2.13
82121 medical furniture	0.04	0.01	0.44	1.33	0.19	0.12	0.23	0.49	0.01	0.02	0.05	0.27	0.39	0.74	0.00	0.04	0.23	0.18	0.08	0.73
82191 metal furniture nes	0.36	0.17	3.56	1.35	0.62	0.46	1.52	0.47	1.32	0.34	0.78	0.14	0.98	1.46	2.02	1.03	5.51	2.32	0.72	0.68
82192 wood furniture nes	1.75	1.27	1.47	1.16	6.08	7.77	1.45	0.49	3.75	6.83	7.03	3.80	6.05	6.14	14.71	7.69	1.81	1.39	2.18	2.17
Parts and components																				
82119 pts nes of chairs etc	0.35	0.72	4.12	11.23	0.87	1.39	2.51	3.17	0.74	0.98	0.06	0.37	3.41	4.98	1.07	0.91	1.20	1.73	9.72	25.10
82122 mattresses etc	0.18	1.20	2.71	1.72	13.27	14.33	3.00	1.83	1.06	0.39	0.07	1.74	2.66	3.52	2.51	1.14	0.71	0.57	1.88	2.18
82199 other furniture, parts nes	0.44	0.69	1.14	1.40	3.33	4.16	1.22	0.92	2.95	6.71	1.48	4.66	1.60	2.95	0.67	2.47	3.25	1.62	4.18	3.94
Final products	1.60	1.24	2.03	1.24	4.76	5.60	1.64	0.67	4.88	4.46	3.94	2.70	5.61	7.09	10.78	5.25	2.82	1.41	2.03	1.89
Parts and components	0.36	0.79	2.38	5.44	4.67	4.81	1.99	1.99	1.87	3.28	0.75	2.41	2.38	3.87	1.18	1.61	2.09	1.48	5.39	12.21
Imports	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
82111 chairs and other seats	0.47	0.26	0.63	0.50	0.65	0.81	0.71	0.37	1.11	0.69	0.92	0.35	0.40	0.31	0.15	0.15	0.65	0.40	0.29	0.82
82121 medical furniture	3.49	1.56	2.15	0.82	1.01	1.59	1.66	0.63	2.81	2.09	2.43	2.00	1.55	0.94	1.25	0.96	1.61	0.63	1.48	1.23
82191 metal furniture nes	1.44	0.84	1.28	1.02	0.95	1.30	1.37	0.84	1.48	1.87	1.36	0.88	0.77	1.16	0.38	0.87	0.90	0.52	0.64	0.81
82192 wood furniture nes	1.13	1.04	0.82	0.52	0.96	1.12	0.95	0.64	2.14	1.62	1.80	1.05	0.55	0.57	0.35	0.51	0.66	0.52	0.38	1.88
Parts and components																				
82119 pts nes of chairs etc	0.22	0.40	1.17	4.34	0.19	0.25	0.66	1.92	0.18	0.11	0.06	0.46	0.92	1.78	0.07	0.32	1.60	4.44	2.43	3.05
82122 mattresses etc	0.06	0.24	0.84	0.56	0.20	1.37	0.34	0.20	0.26	0.80	0.20	1.00	0.33	0.22	0.06	0.13	0.11	0.51	0.63	1.07
82199 other furniture, parts nes	1.31	1.23	1.02	0.98	1.17	1.02	1.11	0.82	0.85	1.23	0.63	0.79	0.92	0.96	0.55	0.47	0.64	0.65	0.65	1.35
Final products	1.03	0.77	0.86	0.58	0.85	1.05	0.94	0.57	1.73	1.35	1.46	0.83	0.56	0.57	0.32	0.45	0.72	0.48	0.42	1.36
Parts and components	0.71	0.75	1.01	2.00	0.67	0.84	0.79	1.05	0.52	0.77	0.37	0.73	0.76	1.07	0.30	0.35	0.74	1.87	1.09	1.85

Source: Computations based on EU data from UN COMTRADE Statistics.

Appendix Table 13: Aggregate Networks' Final Products, Components and Parts, 1993 and 1998

Value in \$ Million	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
Exports	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Final Products	29	46	558	2,183	9	255	149	4,206	13	39	12	44	1,066	3,003	306	359	97	1,756	416	1,056
Components	2	6	33	286	2	18	127	313	0	1	1	30	79	344	6	11	3	15	43	100
Parts	5	15	169	1,343	4	130	274	1,338	1	14	1	20	150	725	11	110	24	429	195	517
Total-final, comp. & parts	36	67	760	3,811	15	403	550	5,857	15	54	14	94	1,295	4,072	323	479	124	2,200	655	1,673
Manufactures (excl. chemical)	628	1,638	4,764	13,865	121	1,180	3,622	13,951	131	606	162	974	6,112	13,562	1,779	5,122	1,212	5,262	3,264	5,142
Imports	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Final Products	175	258	737	1,618	52	346	871	1,557	101	267	96	335	1,297	2,977	186	649	135	688	488	1070
Components	6	16	46	268	1	152	118	1,058	1	12	1	26	191	467	11	41	13	111	81	94
Parts	43	76	388	1,336	8	171	454	1,849	16	56	21	65	518	1,950	79	189	76	1,022	323	502
Total-final, comp. & parts	224	350	1,171	3,223	61	670	1,443	4,464	118	334	119	426	2,005	5,394	276	878	224	1,821	893	1,665
Manufactures (excl. chemical)	1,108	1,873	6,346	14,531	187	2,234	5,762	13,840	311	1,320	350	1,802	8,711	22,812	2,046	5,589	1,386	5,182	3,060	5,604
Trade Shares: (as % of Manufacturing excluding Chemicals)																				
	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
Exports	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Final Products	4.6	2.8	11.7	15.7	7.7	21.6	4.1	30.1	10.0	6.4	7.6	4.5	17.4	22.1	17.2	7.0	8.0	33.4	12.8	20.5
Components	0.3	0.4	0.7	2.1	1.5	1.5	3.5	2.2	0.1	0.2	0.3	3.1	1.3	2.5	0.3	0.2	0.2	0.3	1.3	1.9
Parts	0.9	0.9	3.5	9.7	3.2	11.0	7.6	9.6	1.1	2.2	0.7	2.1	2.5	5.3	0.6	2.1	2.0	8.2	6.0	10.1
Total-final, comp. & parts	5.7	4.1	16.0	27.5	12.5	34.2	15.2	42.0	11.2	8.9	8.6	9.6	21.2	30.0	18.1	9.4	10.2	41.8	20.1	32.5
Manufactures (excl. chemical)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Imports	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Final Products	15.8	13.8	11.6	11.1	27.8	15.5	15.1	11.2	32.3	20.2	27.6	18.6	14.9	13.1	9.1	11.6	9.8	13.3	15.9	19.1
Components	0.6	0.8	0.7	1.8	0.5	6.8	2.0	7.6	0.4	0.9	0.4	1.4	2.2	2.0	0.5	0.7	0.9	2.1	2.7	1.7
Parts	3.9	4.1	6.1	9.2	4.3	7.7	7.9	13.4	5.3	4.2	6.0	3.6	5.9	8.5	3.9	3.4	5.5	19.7	10.6	9.0
Total-final, comp. & parts	20.2	18.7	18.4	22.2	32.6	30.0	25.1	32.3	38.0	25.3	33.9	23.6	23.0	23.6	13.5	15.7	16.2	35.2	29.2	29.7
Manufactures (excl. chemical)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix Table 13 continued: Aggregate Networks' Final Products, Components and Parts, 1993 and 1998

Market Shares: (as % of EU external trade)																				
	Bulgaria		Czech Rep.		Estonia		Hungary		Latvia		Lithuania		Poland		Romania		Slovakia		Slovenia	
<i>EU Imports</i>	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Final Products	0.03	0.03	0.58	1.30	0.01	0.15	0.15	2.50	0.01	0.02	0.01	0.03	1.10	1.78	0.32	0.21	0.10	1.04	0.43	0.63
Components	0.01	0.02	0.20	0.76	0.01	0.05	0.79	0.83	0.00	0.00	0.00	0.08	0.49	0.91	0.03	0.03	0.02	0.04	0.27	0.27
Parts	0.01	0.02	0.34	2.18	0.01	0.21	0.55	2.17	0.00	0.02	0.00	0.03	0.30	1.18	0.02	0.18	0.05	0.70	0.39	0.84
<i>Total-final, comp. & parts</i>	0.02	0.02	0.47	1.42	0.01	0.15	0.34	2.19	0.01	0.02	0.01	0.04	0.80	1.52	0.20	0.18	0.08	0.82	0.40	0.62
Manufactures (excl. chemical)	0.12	0.20	0.88	1.69	0.02	0.14	0.67	1.70	0.02	0.07	0.03	0.12	1.13	1.65	0.33	0.62	0.22	0.64	0.60	0.63
<i>% in EU-Exports</i>	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998	1993	1998
Final Products	0.17	0.14	0.73	0.87	0.05	0.19	0.86	0.83	0.10	0.14	0.10	0.18	1.28	1.60	0.18	0.35	0.13	0.37	0.48	0.57
Components	0.03	0.04	0.23	0.63	0.00	0.36	0.59	2.49	0.01	0.03	0.01	0.06	0.95	1.10	0.05	0.10	0.06	0.26	0.41	0.22
Parts	0.09	0.14	0.78	2.39	0.02	0.31	0.91	3.30	0.03	0.10	0.04	0.12	1.04	3.49	0.16	0.34	0.15	1.83	0.65	0.90
<i>Total-final, comp. & parts</i>	0.13	0.12	0.68	1.13	0.04	0.23	0.84	1.57	0.07	0.12	0.07	0.15	1.17	1.89	0.16	0.31	0.13	0.64	0.52	0.58
Manufactures (excl. chemical)	0.19	0.21	1.09	1.61	0.03	0.25	0.99	1.53	0.05	0.15	0.06	0.20	1.49	2.53	0.35	0.62	0.24	0.57	0.52	0.62

Note: See Table 1 for the definitions of 'final' products, components and parts.

Source: Computations based on EU data from UN COMTRADE Statistics.

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